Assessment, Experience and Measurement of Body-focused Psychological Processes Across Clinical Contexts



UNIVERSITY OF OXFORD

By

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A thesis submitted in partial fulfilment of the requirements for the degree of

Doctor of Clinical Psychology (DClinPsych)

The Oxford Institute of Clinical Psychology Training and Research

Worcester College | University of Oxford

Trinity Term

May 2025



Word Count

Systematic Review: 6927

Service Improvement Project: 5169

Theoretically Driven Research Project: 5015

Executive Summary: 832

Connecting Reflective Narrative: 998

Total word count: 18,941

Please note that these word counts exclude references and appendices.

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Abstracts

Abstract 1: Systematic Review

Background: Mental imagery plays a key role in the onset, maintenance, and treatment of psychological disorders. Research on mental imagery in body dysmorphic disorder (BDD), a condition characterized by negative appearance-based self-appraisals, has gained recognition in theoretical models and interventions. However, the scope and implications of this work remain unreviewed. This systematic review (PROSPERO CRD42023450339) aimed to identify characteristics and mechanisms of imagery in BDD.

Method: MEDLINE, EMBASE, PsycINFO, CINAHL, Scopus, and Web of Science were searched, synthesising qualitative and quantitative data using meta-integration. Quality was assessed using the Mixed Methods Appraisal Tool.

Results: Thirty-eight studies were identified amongst 34 publications. Study quality was mixed with significant heterogeneity in methods. Mental imagery in BDD is consistently reported to be vivid, emotionally intense, recurrent, and important in the maintenance, and potentially onset, of BDD. These findings concur with theoretical frameworks of BDD (and other anxiety-related presentations) which place centrality on imagery and encourage the use of imagery-based interventions. Crucial areas for future work include stronger causal tests, unpacking mechanisms, examining individual differences and intersectionality, and exploring the potential for imagery-based approaches for treatment and prevention. No funding to report.

Abstract 2: Service Improvement Project

Objective: The Eating Disorder Examination Questionnaire (EDE-Q) and Clinical Impairment Assessment (CIA) are widely applied for measuring eating disorder psychopathology, but experience problems when applied in inpatient services. This service improvement project aimed to adapt the EDE-Q and CIA psychometric measures to be applicable to Cotswold House, an adult inpatient service, trial the adapted measures and gain feedback from patients.

Method: We used qualitative feedback from staff, patients and experts by experience to develop adapted versions of the EDE-Q and CIA. 12 patients at Cotswold House trialled the measures for a six-week period. Semi-structured interviews (*N=9*) gained qualitative data on patients' views on the adapted measures, from which themes were analysed using the framework method.

Results: Patients spoke positively about the adapted measures, especially the shorter time frame and the removal and adaptation of questions to better fit their experience. Recommendations for Cotswold House, including the adapted measures, were generated.

Discussion: Our findings demonstrate feasibility and substantial clinical benefit to developing validated inpatient versions of the measures, which may motivate psychometric validation of the EDE-I and CIA-I. Adapting the measurement process demonstrably enhanced patient experience and increased the utility of psychometric data compared to the original measures.

Public significance statement: This study uses first-person accounts of staff, patients and experts by experiences to punctuate the need for adapting the EDE-Q and CIA to inpatient services, together with a demonstration of feasibility in adapting the measures. This adds to the growing literature of adapting eating disorder measures to improve services.

Abstract 3: Theoretically Driven Research Project

Objectives: To evaluate the contribution of health anxiety, mental defeat and fear of recurrence and progression (FRP) as variables in the adjustment process following cardiac events and subsequent wellbeing, adjustment and rehabilitation.

Design: A two-part study was conducted, cross-sectionally examining psychological factors shortly following a cardiac event, and longitudinally examining how these variables associated with adherence and physical/psychological outcomes of cardiac rehabilitation.

Methods: A UK-based sample of post-cardiac event patients (N=176, M_{age}=66.1, SD=10.0) were categorised as high health anxiety with depression and/or anxiety, depression or anxiety only, or neither health anxiety nor depression/anxiety. Mental defeat and FRP were compared across groups pre-rehabilitation, and examined in relation to adherence and outcomes of an 8-session cardiac rehabilitation program.

Results: Analyses indicated significantly higher mental defeat and FRP in those with health anxiety than other groups. However, regression analyses showed neither health anxiety, mental defeat nor FRP were significantly associated with rehabilitation adherence or outcomes.

Conclusions: This study identified mental defeat and FRP as important factors in health anxious cardiac patients, with implications for the coping and adjustment process and rehabilitative efforts. No linear association between these variables and rehabilitation adherence and outcomes were found, suggesting more nuanced approaches to identifying their impact on rehabilitation may require development.

Systematic Review of the Literature

Mental Imagery of the Self in Body Dysmorphic Disorder: A Mixed-Methods Systematic Review

The Oxford Institute of Clinical Psychology Training & Research

University of Oxford

Internal Supervisor: Dr Matthew Hotton

External supervisors: Dr Alex Lau-Zhu, Professor David Veale

Word count: 6927; **(**6027 + 900 [600 words from 6 tables + 300 words from 4 figures [37+63+100+100]])

Target Journal: Body Image. This journal publishes widely on articles related to body image-related psychological factors, of which this review is relevant. Guidance for authors available in Appendix A.

Declaration of competing interest: None.

Abstract

Background: Mental imagery plays a key role in the onset, maintenance, and treatment of psychological disorders. Research on mental imagery in body dysmorphic disorder (BDD), a condition characterized by negative appearance-based self-appraisals, has gained recognition in theoretical models and interventions. However, the scope and implications of this work remain unreviewed. This systematic review (PROSPERO CRD42023450339) aimed to identify characteristics and mechanisms of imagery in BDD.

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Keywords: body dysmorphic disorder, body dissatisfaction, mental imagery, intrusive imagery, CBT, imagery rescripting, EMDR

1. Introduction

1.1. Body dysmorphic disorder

Body Dysmorphic Disorder (BDD) is defined in the International Classification of Diseases-11 (ICD-11; World Health Organization, 2019) and Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychological Association, 2013) as a condition characterised by intense and persistent preoccupation with one or more perceived flaws or defects in physical appearance. These may appear minor, insignificant, or unobservable to others, consume substantial time and mental resources, leading to significant distress and dysfunction in various areas of life. Prevalence is approximately equal across genders, with onset typically in adolescence, persisting through adulthood with low rates of spontaneous remission (Phillips, 2009, 2017).

The clinical features of BDD are specific to the preoccupations of the individual. These include: (1) body areas of concern, or "perceived flaws" (Veale et al., 2004b), most commonly hair, facial features and skin, shape and/or weight (Phillips et al., 2009); (2) Rigid negative appraisals regarding perceived flaws, including beliefs about social rejection *"They think my teeth are yellow, so will reject me"*, perceived inability to meet goals *"I am unattractive and only attractive people can be successful"*, or health *"My skin looks worse because I am weaker"*, (Didie et al., 2010); (3) behaviours intended to alleviate distress, such as masking flaws (e.g. make-up, grooming) altering flaws (e.g. skin-picking, cosmetic surgery), or hypervigilance (e.g. mirror-checking, reassurance-seeking, comparison to others). While these behaviours provide short-term relief, they reinforce beliefs that the perceived flaws are significant, and perpetuate cycles of distress (Veale, 2004b).

The National Institute for Health and Care Excellence (NICE) recommend cognitive-behavioural therapy (CBT) as a primary treatment for BDD (NICE, 2005). Meta-analyses

(Zhao et al., 2024) show CBT effectively reduces BDD symptom severity, with significant reductions in BDD-YBOCS scores compared to controls with large effect sizes (SMD=−1.51, 95% CI=[−2.81;−0.21]). However, only 40–54% of patients achieve responder status, defined as a 30% or greater reduction on the BDD-YBOCS (Harrison et al., 2016), and just 20% achieve full remission within four years (Phillips et al., 2013). These rates are lower than for OCD, where 60–80% typically respond (Mataix-Cols et al., 2016). Additionally, CBT benefits diminish at follow-up beyond three months compared to controls (SMD=−2.30, 95% CI=[−4.98,0.37]; Zhao et al., 2024).

As such, while CBT is effective, sustained improvements may require alternative or modified treatments. Improving BDD outcomes requires better understanding of mechanisms involved in its development, maintenance, and improvement (Liu et al., 2024). This review focuses on mental imagery, a crucial but underexplored process in BDD compared to other anxiety-related disorders.

1.2. Mental Imagery

Mental imagery refers to cognitive representations of perceptual experience (Kosslyn et al., 2006; Pearson et al., 2015), commonly occurring in dreams, memories, goal-setting, and emotion regulation (Kosslyn & Jolicoeur, 2021). Unlike sensory perception, mental imagery: (1) involves a subjective semblance of sensory input across all modalities, though visual is most common (Pearson et al., 2015); (2) may include past experiences or novel representations; (3) can depict static or dynamic, concrete or abstract scenarios; (4) can be deliberate or involuntary. Involuntary imagery is described by various terms, including unwanted mental intrusions (Pascual-Vera et al., 2019), intrusive mental images (Brewin et al., 2010), and spontaneous imagery (Osman et al., 2004).

Imagery can causally influence physical or emotional symptoms such as distress and dissociation. Its recurrent, intrusive nature (Pearson et al., 2015), often maintains psychological disorders, especially when linked to early adverse memories or negative core beliefs (Brewin et al., 2010; Chapman et al., 2020). Attempts to avoid or suppress intrusive images can perpetuate both the imagery and related negative thoughts (Ji et al., 2019).

Imagery-based interventions use mental representations to address psychological issues. Techniques include standalone methods like imagery rescripting (ImRs), guided imagery, and imaginal exposure (Saulsman et al., 2019) or components of interventions such as cognitive-behavioural therapy (CBT), exposure with response prevention (ERP), and metacognitive therapy (MCT). Imagery interventions are integral to several manualised versions of CBT for anxiety disorders, depression, and phobias (Kip et al., 2023), involving reprocessing memories or exposure to threatening stimuli without physical presence. In BDD, this often involves appearance-related memories or stimuli linked to perceived flaws.

1.3. Mental imagery in BDD

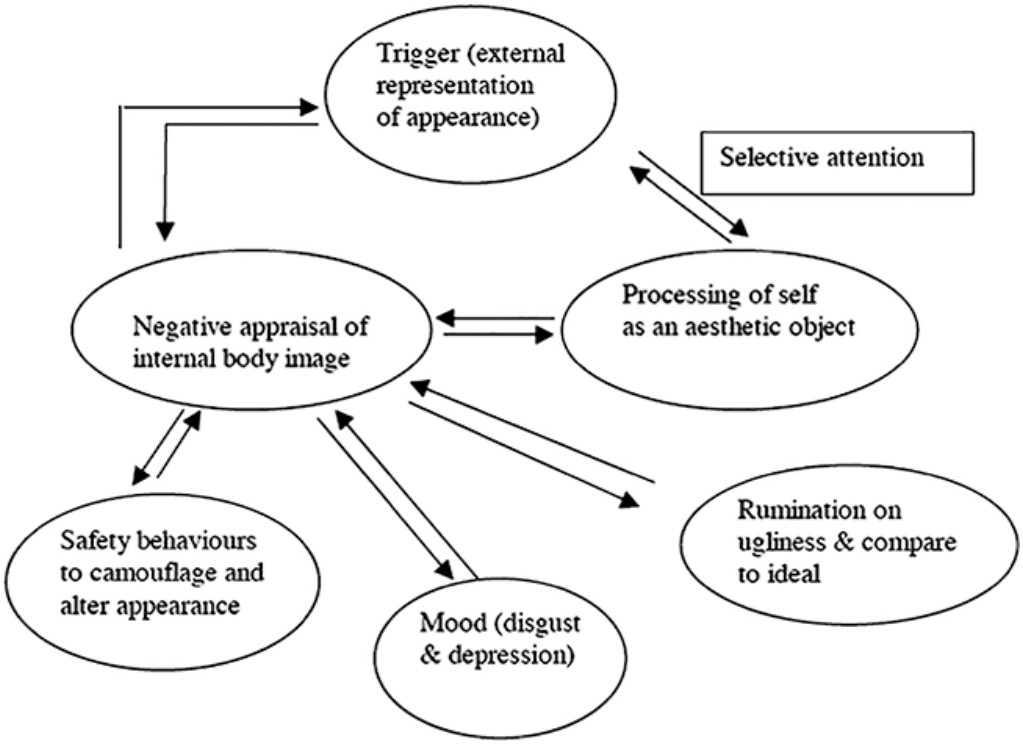
A cognitive-behavioural model of BDD, conceptualised by Veale (2004a; 1996), has seen successful application to therapeutic efforts in BDD and other body image-related problems in adults (Harrison et al., 2016). It explains BDD development through factors related to body dissatisfaction, centring on the concept of *'self as an aesthetic object'*, that is, extreme self-focussed attention and self-consciousness due to judging oneself by perceived defect(s) (Baldock et al., 2017). The model posits individuals experience an intrusive 'felt sense' (imagery) that portrays this perceived ugliness or defectiveness with a deep sense of shame. The 'felt sense' may include visual, sensory, or olfactory domains (Osman et al., 2004). Attention becomes fixated on the 'felt sense', which triggers self-focused attention, negative body image appraisals, comparisons between perceived and ideal (aesthetic) selves, and negative emotions. External appearance-checking behaviours (e.g., mirror checking,

photos, rumination) reinforce negative self-images, reinforcing the processing of the self as an aesthetic object.

Over time, these patterns increase behaviours aimed at altering, hiding, or improving appearance, such as camouflaging, social withdrawal, or appearance-altering procedures. These behaviours function as safety-seeking strategies to monitor distress sources, conceal perceived flaws, avoid scrutiny, or seek reassurance (Veale et al., 1996). The model is presented graphically in Figure 1.

Figure 1

Formulation displaying the 'self as an aesthetic object' model of BDD, reproduced with permission from Veale et al. (2004a).



Empirical exploration of imagery in BDD has risen following an initial study by Osman et al., (2004). From their sample of 18 BDD patients, 94% reported imagery that was more spontaneous, intrusive, recurrent, frequent and vivid than non-BDD controls. These images commonly comprised specific perceived flaws and were associated with memories

related to appearance (e.g., involving bullying and/or perceived rejection). Since this study, the role imagery in BDD has been increasingly explored, particularly in relation to disorder maintenance/exacerbation (e.g. Brennan et al., 2023) and therapeutic interventions (Ghaderi et al., 2022; Veale, Anson, et al., 2014).

Although systematic reviews of mental imagery have been conducted in other mood-related areas, including worry (Stavropoulos et al., 2024), suicide and self-harm, (Lawrence et al., 2023), social anxiety (Chapman et al., 2020) and bipolar disorder (Petit et al., 2021), there exists no such review for BDD. Given the proposed importance of imagery in BDD, a comprehensive understanding of its phenomenology, mechanisms, and treatment implications is important.

1.4. Aim of the review

This review aimed to synthesise literature on mental imagery in understanding and treating BDD, evaluating study quality, identifying theoretical/clinical implications, and future research areas. The central question was: What are the characteristics of mental imagery (relevant to the self) in individuals with BDD, and what are the hypothesised mechanisms by which imagery contributes to BDD?

2. Method

2.1. Protocol and reporting guidelines

The review protocol was preregistered at PROSPERO, ID CRD42023450339. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) reporting guidelines for systematic reviews (Page et al., 2021) were followed (Appendix B).

2.2. Eligibility Criteria

Inclusion criteria for eligibility were: (1) studies focussing on BDD or body dissatisfaction as the primary psychological construct; (2) studies involving mental imagery; (3) primary studies comprising quantitative, qualitative or mixed-method data. We included imagery-based intervention studies to help inform the mechanisms through which imagery maintains BDD symptoms.

Exclusion criteria were: (1) literature primarily concerned with eating disorders; (2) publications unsuitable for primary data extraction, such as reporting data secondarily (e.g. reviews, commentaries, editorials), non-standard sources (e.g. websites), and those not peer-reviewed (e.g. books, pre-prints).

2.3. Information Sources

The following databases were searched on February 14, 2025: MEDLINE, EMBASE, PsycINFO, CINAHL, Scopus and Web of Science Core Collection. No restrictions and limitations (e.g. language, publication date, population) were applied.

2.4. Search strategy

Keywords capturing the concepts of mental imagery, BDD and body dissatisfaction were applied to all databases, shown in Table 1, with slight variations due to different search engines.

Table 1.

Search strategy descriptors.

#	Concept	Descriptors
1	Body dysmorphic disorder (BDD)	BDD or "body dysmor*" or "body dissatisfaction" or "body satisfaction"
2	Mental imagery	"mental imag*" or images or imagery or imagination or visualisations or visualizations or aesthetic or esthetic
3	Main search	Concept #1 and Concept #2

2.5. Selection and data collection process

Duplicate records were cross-checked and removed. Publication titles and abstracts (N=3547) were screened against eligibility criteria. 20% were stratified randomly by year of publication (n=709) and screened by two independent researchers (SH & MW), reaching 99.4% agreement (Cohen's Kappa κ=0.94, 95% CI:88;99), denoting "almost perfect agreement" (McHugh, 2012). All remaining records were screened by SH.

Full-text publications (N=124) were screened further, 25% by two researchers (SH & MW) independently (n=31), from which seven disagreements were detected and resolved with the supervising co-authors (ALZ & MH). With agreements resolved, the remaining were assessed by the lead author. Data were extracted by two researchers (SH & MW) for 50% (n=17) of records, which were checked for discrepancies, of which none were encountered. The remaining records (n=17) were extracted by SH.

2.6. Quality assessment

Studies were appraised using the Mixed-Method Appraisal Tool (MMAT; Hong et al., 2018), a reliable indicator of validity, reliability and generalisability in qualitative, quantitative and mixed-methods studies (Pace et al., 2012). Considering the relevance of

subjective experience in mental imagery, a mix of qualitative and quantitative approaches was expected. Following MMAT guidelines, individual criterion ratings are provided (Section 3.1.1), rather than overall quality scores (Hong et al., 2018). Two independent reviewers (SH & MW) assessed quality for all studies.

2.7. Synthesis method

A meta-integration was performed using the Joanna Briggs Institute (2014) convergent segregated approach involving: (1) quantitative synthesis; (2) qualitative synthesis; (3) integration of syntheses, noting complementary and conflicting results. For mixed methods studies, quantitative and qualitative findings were separated before analysis. Appendix C details author position statements to acknowledge subjectivity of such interpretation.

For quantitative studies, narrative synthesis was performed as outlined by Popay et al. (2006). This process involved (1) organising extracted data into meaningful categories; (2) grouping findings by themes or patterns; (3) exploring and reporting relationships between data. A meta-analytic approach was precluded due to study heterogeneity in terms of designs and measures (Section 3.1.3).

For qualitative studies, Thematic Synthesis was performed as described by Thomas and Harden (2008). This process involved: (1) coding text from eligible studies; (2) developing descriptive themes; (3) generating analytical themes. All contents of the findings and results sections of studies were classified as data. For mixed methods studies, this occurred after separation of quantitative results.

3. Results

3.1. Study selection

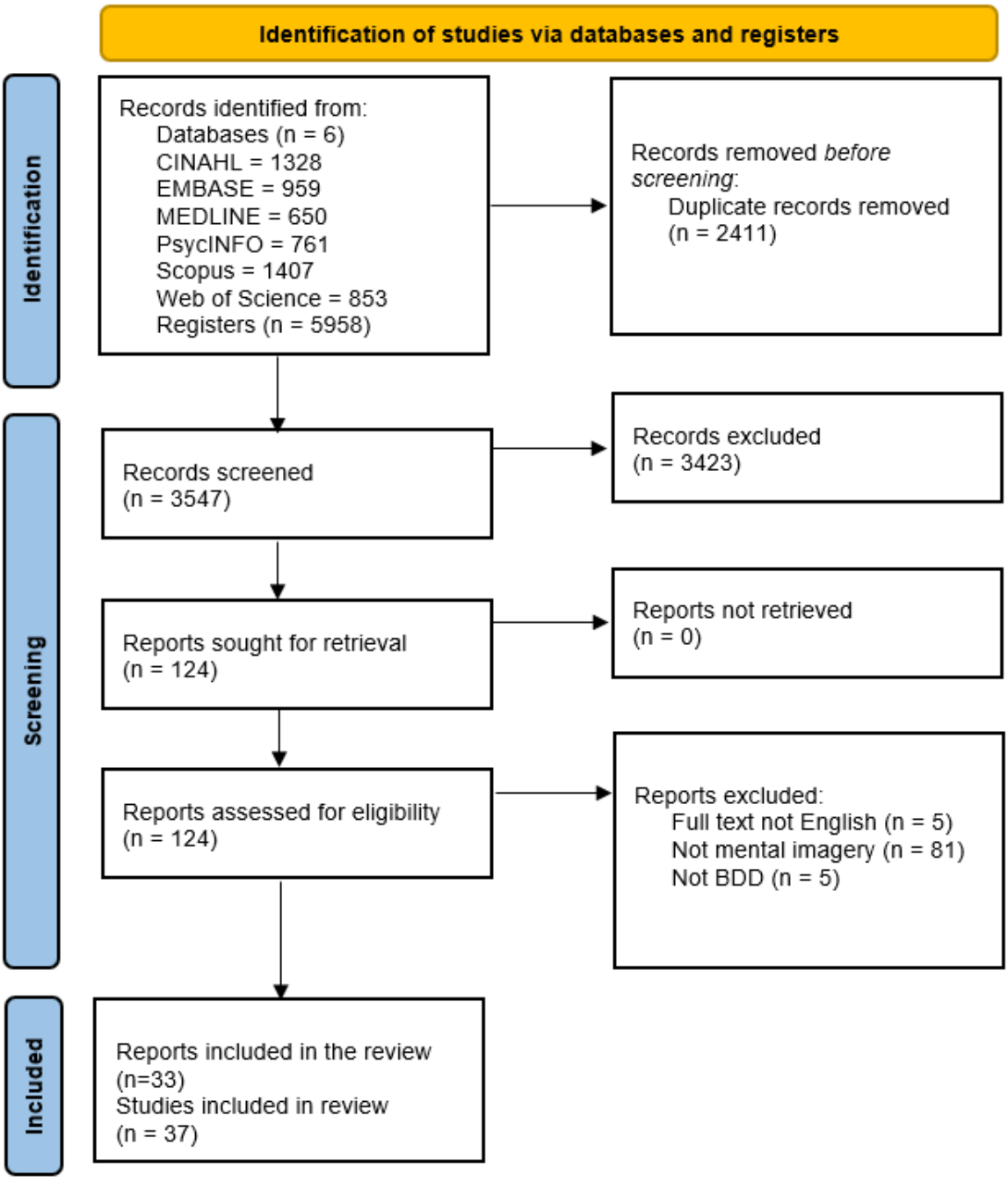
From 5958 initial records, 3547 abstracts were screened, with 124 publications assessed in full. Thirty-seven studies from 33 records were included (some records included multiple studies): 29 quantitative, six qualitative, and two mixed-methods. Study selection is shown in Figure 2.

Included studies spanned 1997 to 2024, most commonly 2022 (n=6), followed by 2014, 2015, 2023, and 2024 (each n=3). Research was predominantly from the "Global North," primarily the UK (n=14), Spain (n=5), USA (n=3), and Australia (n=3). Germany, Iran, and China contributed two studies each; Japan, Sweden, and Singapore contributed one each. One UK study included participants from India, the UK, and USA (Craythorne et al., 2022), and one Spanish study included participants from seven countries (Pascual-Vera et al., 2022).

Seventeen papers involved specific body areas of concern, the most frequent being skin (n=8), face, hair, nose (each n=6), eyes, genitalia and legs (each n=5). All non-intervention studies (n=25) were cross-sectional. Of the intervention studies (n=12), 3 were randomised controlled trials (RCT) with the remainder (n=9) non-randomised. Interventions comprised ImRs as stand-alone (n=3), CBT incorporating ImRs (n=2), MCT (n=1), eye-movement reprocessing and desensitisation (EMDR, n=3), mindfulness-based cognitive therapy (MBCT, n=1) and exposure with response prevention (ERP, n=1).

Figure 2

PRISMA flow diagram.



3.1.1. Quality appraisal

Quantitative studies varied in quality, with most lacking representative BDD samples, adequate control of confounders, or justified psychometrics. Comparability was hindered by the wide range of BDD measurement tools used (Section 3.1.3). The three high-quality

randomised-controlled trials (RCTs, Ghaderi et al., 2022; Gu & Zhu, 2023; Veale, Anson, et al., 2014) consistently scored poorly on intervention blinding, a common issue in psychological research. Other intervention studies were generally lower quality than experimental studies, often lacking clear procedures, sampling rationale, and control of confounders.

Qualitative studies were generally high quality, with no study receiving a 'fail' on any criterion. However, some had underexplained methods, obscuring data collection processes (Brennan et al., 2023; Silver & Reavey, 2010; Stechler & Henton, 2022) and coherence between data and their interpretations (Cooper & Osman, 2007; Craythorne et al., 2022). Of the two mixed method studies, one scored fairly with unclear qualitative methodology (Osman et al., 2004); the other scored poorly due to significant underreporting of methods and findings (Ghaderi et al., 2022). Full quality assessment outcomes are displayed in Table 2.

Table 2

Quality assessment using Mixed Methods Appraisal Tool (MMAT).

	Brennan et al. (2023)	Cooper and Osman (2007)	Craythorne et al. (2022)	Onden-Lim and Grisham (2013)	Silver and Reavey (2010)	Stechler and Henton (2022)	Ghaderi et al. (2022) - Study 3	Gu and Zhu (2023)	Veale et al. (2014)	Brown et al. (1997)	Chuah and Suendermann (2024)	Dziegielewski and Wolfe (2000)	Farrar et al. (2015)	Ghaderi et al. (2022) - Study 2	Grocholewski et al. (2018)	Hamamoto et al. (2024)	McKay et al. (1997)	Moreno-Domínguez et al. (2012)	Pascual-Vera et al. (2022)	Pouladi et al. (2024)	Rabiei et al. (2012)	Ritter and Stangier (2016)	Stindermann et al. (2016)	Van den Berg and Thompson (2007)	Veale and Riley (2001)	Veale et al. (2016)	Willson et al. (2016)	Darling et al. (2015)	Giraldo-O'Meara and Belloch (2018)	Giraldo-O'Meara and Belloch (2019) - Study 1	Giraldo-O'Meara and Belloch (2019) - Study 2	Giraldo-O'Meara and Belloch (2019) - Study 3	Liu et al. (2023)	Onden-Lim and Grisham (2012)	Pascual-Vera et al. (2019)	Veale et al. (2015)	Ghaderi et al. (2022) - Study 1	Osman et al. (2004)
Screening questions																																						
S1. Are there clear research questions?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
S2. Do the collected data allow to address the research questions?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	-	✓	✓	✓	✗	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Qualitative studies																																						
1.1. Is the qualitative approach appropriate to answer the research question?	✓	✓	✓	✓	✓	✓																																
1.2. Are the qualitative data collection methods adequate to address the research question?	-	✓	✓	✓	-	-																																
1.3. Are the findings adequately derived from the data?	✓	✓	✓	-	✓	✓																																
1.4. Is the interpretation of results sufficiently substantiated by data?	✓	✓	✓	-	✓	✓																																
1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?	✓	-	-	✓	✓	✓																																
Quantitative randomised studies																																						
2.1. Is randomization appropriately performed?							✓	✓	✓																														
2.2. Are the groups comparable at baseline?							✓	✓	✓																														
2.3. Are there complete outcome data?							✓	✓	✓																														

| | | |

3.1.2. Demographic data

All studies focused on the working-age adult (18-65 years) population: only one study included a participant below age 18 (Rabiei et al., 2012), at 16 years old. Participants were typically aged 18-60, with mean age varying widely across studies, with the lowest ~19 years (Onden-Lim & Grisham, 2013), and the oldest ~42 years (Veale et al., 2015). The oldest participants across studies were 64 years old (Pascual-Vera et al., 2022).

Around half (*n*=18; 48.6%) did not report ethnicity data. When reported, most studies examined a predominant ethnic group; either White British/other in the "Global North" (Veale et al., 2015) or Chinese or Singaporean Asian (Chuah & Suendermann, 2024; Liu et al., 2023). Three studies (Van den Berg & Thompson, 2007; Pascual-Vera et al., 2022; Onden-Lim & Grisham, 2013) included varied ethnicities with no predominant group. Some studies also reported marital status (n=10), education level (n=9), socioeconomic status (n=5), employment (n=5), BMI (n=5), and mental health comorbidity (n=6).

3.1.3. Measurement

BDD. Twenty instruments measured BDD symptomology across studies, including those broadly designed for BDD, body dissatisfaction and eating disorders. Most common were the Yale-Brown Obsessive-Compulsive Scale Modified for Body Dysmorphic Disorder (BDD-YBOCS; Phillips et al., 1997, n=11) and Body Dysmorphic Disorder Diagnostic Module (BDDDM; Phillips, 2017, n=4). Nineteen included participants with a formal diagnosis of BDD, established using the Structured Clinical Interview for DSM-IV and DSM-IV-TR (SCID-IV; SCID-IV-TR; Glasofer et al., 2015; n=7); BDD-YBOCS (n=5); checking against DSM-IV diagnostic criteria (n=4); Body Dysmorphic Disorder Questionnaire (BDDQ; Brohede et al., 2013, n=2) or BDDDM (n=2).

Imagery. Eight self-report measures assessed mental imagery: the Thought Fusion Inventory (TFI; Wells & Carter, 2001), Questionnaire of Unpleasant Intrusive Thoughts (QUIT; Pascual-Vera et al., 2019), Intrusive Visual Imagery Scale (IVIS; McCarthy-Jones et al., 2012), Appearance Intrusions Questionnaire (AIQ; Giraldo-O'Meara & Belloch, 2019), Vividness of Visual Imagery Questionnaire (VVIQ; Marks, 1989), Mirror-gazing: Cognition and Affect Rating Scale (MG-CARS; Windheim et al., 2011), and EMDR treatment scales: Subjective Units of Disturbance (SUD) and Validity of Cognition (VOC) (Shapiro, 2001). The AIQ (Giraldo-O'Meara & Belloch, 2019) specifically measured frequency of unwanted appearance-related intrusive thoughts, images, impulses and sensations. Three instruments (IVIS, VVIQ, QUIT) measured imagery content, modality, vividness and affective change. Two instruments (MG-CARS, EMDR SUD and VOC) measured only affective change. The TFI measured metacognitive beliefs about the interpretation of intrusive thoughts (Rabiei et al., 2012).

Nine studies used semi-structured interviews to explore imagery. Three based their interviews on the same schedule pioneered by Ann Hackmann (Osman et al., 2004, Onden-Lim & Grisham, 2012a; Grocholewski et al., 2018). To help evoke imagery during interviews, one study invited participants to bring photos of themselves from childhood, using these to recollect memories and present-day appearance comparisons (Silver & Reavey, 2010). Another asked participants to complete an autobiographical writing task about an appearance-related memory (Craythorne et al., 2022).

Seven experimental studies and nine intervention studies did not measure imagery directly, but incorporated imagery as a component of the experimental or therapeutic paradigm to measure another construct within BDD, rather than a study outcome. The only intervention studies including imagery as an outcome were one EMDR study (Ghaderi et al., 2022) one MCBT study (Gu et al., 2023) and one MCT study (Rabiei et al., 2012).

3.2. Quantitative synthesis

Thirty-one studies were included in the quantitative synthesis. These were organised as non-intervention (n=19) or intervention (n=12) studies, summarised in Tables 3 and 4 respectively.

Table 3

Summary of non-intervention studies included in quantitative synthesis.

Authors and years of publication	Population (N, age, sex, formal diagnosis* Y/N)	Comparison groups, treatment and/or clinical group (if applicable)	Outcome measures used (BDD)	Outcome measures used (Imagery)	Main findings**
Chuah and Suendermann (2024)	N = 63 Mean age: 21.22 Sex: M = 28, F = 35 Diagnosis: No	Mirror gazing with high self-focus vs Mirror gazing with low self-focus	Body Image Disturbance Questionnaire (BIDQ; Cash et al., 2004), Visual analogue scales for body dissatisfaction	Visual analogue scales for vividness and emotional quality (100-point scale)	High self-focused attention did not increase the vividness or emotional negativity of appearance-related imagery in healthy participants.
Darling et al. (2015)	N = 111 Mean age: 26.53 Sex: M = 0, F = 111 Diagnosis: No	N/A: The study used cognitive exercises to assess vividness of visual imagery and body shape, but it did not involve interventions, comparisons, or treatment groups.	The Body Shape Questionnaire-16A (BSQ-16A; Evans & Dolan, 1993), Visual analogue scale for body dissatisfaction	VVIQ	Higher visual mental imagery was associated with lower body dissatisfaction.
Farrar et al. (2015)	N = 66 Mean age: Positive imagery = 20.18, Negative imagery = 19.73 Sex: M = 0, F = 66 Diagnosis: No	Positive imagery manipulation vs Negative imagery manipulation	Body Shape Questionnaire (BSQ; Cooper et al., 1987)	Idiographic Vividness scale (0-100). Idiographic Positive/negative image scale (0-100).	Negative imagery manipulation reduced self-esteem, body satisfaction, and clarity of self-concept, while increasing negative affect. Positive imagery manipulation improved explicit self-esteem and body satisfaction but did not affect clarity of self-concept.
Ghaderi et al. (2022) – Study 1***	N = 31 Mean age: 27.8 Sex: M = 0, F = 31 Diagnosis: No	N/A	BSQ, IBSS	Visual analogue scale to measure frequency, vividness and relative negative affect of mental imagery.	All participants experienced body-related mental images, either positive (e.g., feeling strong or enjoying well-fitting clothes) or negative (e.g., self-criticism about weight, aging, or past pregnancies). Body dissatisfaction was significantly linked to the frequency and negative nature of these images, but not to positive images or general mental imagery.

Giraldo-O'Meara and Belloch (2019) - Study 1	N = 410 Mean age: 23.5 Sex: M = 103, F = 307 Diagnosis: No	No comparison group.	None.	AIQ	Non-clinical individuals experience intrusive thoughts and images related appearance defects. The phenomenology of these experiences were used to derive a five-factor structure for appearance intrusions, in support of the AIQ.
Giraldo-O'Meara and Belloch (2019) - Study 2	N = 583 Mean age: 29.8 Sex: M = 166, F = 417 Diagnosis: No	No comparison group.	None.	AIQ	Over 90% of respondents reported experiencing at least one appearance-related intrusive thought (AIT), with women reporting significantly higher total scores on the AIQ compared to men, except in the "urge to do something" subscale.
Giraldo-O'Meara and Belloch (2019) - Study 3	N = 583 Mean age: BDD risk = 22.59, No BDD risk = 30.91 Sex: M = 147, F = 359 Diagnosis: Yes	At risk of BDD vs Not at risk of BDD	BDDQ, Multidimensional Body-Self Relations Questionnaire - Appearance Scales (MDBSRQ; Cash, 2000)	AIQ	Strong correlations were found between AIQ, BDD-related symptoms and body image concerns, with the highest associations seen with the body areas satisfaction subscale of the MBSRQ. Individuals at risk for BDD reported significantly more appearance-related intrusive thoughts than those at no risk.
Giraldo-O'Meara and Belloch (2018)	N = 40 Mean age: BDD = 23.10, High risk for BDD = 22.87, Low risk for BDD = 24.00 Sex: M = 21, F = 19 Diagnosis: Yes	BDD vs High-risk for BDD vs Low-risk for BDD	BDD-YBOCS, BDDQ, SCID-IV	AIQ	Most participants experienced unwanted intrusive thoughts about their appearance. Individuals used both positive (cognitive restructuring, distraction) and negative (comparing themselves to others) strategies to control these intrusions.
Grocholewski et al. (2018)	N = 63 Mean age: BDD = 35.26, BIID = 50.73, Control = 38.95 Sex: M = 35, F = 28 Diagnosis: Yes	BDD vs Body Integrity Identity Disorder (BIID) vs non-clinical controls	BDDDM, BIID Screening Questionnaire	Semi-structured interview adapted from Osman et al. (2004)	Individuals with BDD and BIID both experience frequent mental images. BDD participants experienced them as more intrusive and distressing compared to BIID participants, who were more likely to find them sexually arousing.
Hamamoto et al. (2024)	N = 28 Mean age: Mirror exposure = 22.1, Mental imagery = 22.8 Sex: M = 0, F = 28 Diagnosis: No	Mirror exposure vs Mental imagery	Eating Disorder Inventory 2 (EDI-2; Tachikawa et al., 2004), Body image silhouettes	None.	Mental imagery, rather than mirror exposure, was found to be more effective in reducing perceptual disturbances and enhancing visual processing.

Liu et al. (2023)	N = 5909 Mean age: 19.87 Sex: M = 2730, F = 3179 Age range: 18-32 Diagnosis: No	N/A: This large survey involved no interventions or treatment groups.	SDBPS	IVIS	This study identified a positive correlation between body dissatisfaction and smartphone addiction, with intrusive imagery and fear of negative evaluation acting as mediators in this relationship.
Moreno-Domínguez et al. (2012)	N = 31 Mean age: 20.12 Sex: M = 0, F = 31 Diagnosis: No	Pure (unguided) mirror exposure vs Guided mirror exposure vs Mental imagery exposure	BSQ, Eating Attitude Test (EAT; Mintz & O'Halloran, 2000), Visual analogue scale for beauty versus ugliness	Idiographic thoughts checklist for negative cognitions	Pure mirror exposure was found to be the most effective intervention for reducing subjective discomfort and sustaining reductions in negative thoughts and body image disturbance. Guided mirror exposure and imagery exposure were less effective compared to pure exposure.
Onden-Lim and Grisham (2012)	N = 92 Mean age: 19.92 Sex: M = 25, F = 67 Diagnosis: No	Imagery suppression vs Imagery monitoring	Body Image Concern Inventory (BICI; Littleton et al., 2005), BDDDM	Self-report forms: Mood, discomfort, effort to suppress intrusions, vividness, believability, perspective of imagery.	Dysmorphic concern was found to predict the vividness and discomfort of appearance-related intrusions but did not affect intrusion frequency or suppression efforts. Suppression reduced intrusion frequency and discomfort temporarily but did not affect the vividness of the intrusions, indicating that suppression could serve as a short-term safety behaviour in individuals with BDD.
Osman et al. (2004)	N = 36 Mean age: 27.5 Sex: M = 18, F = 18 Diagnosis: Yes	BDD vs non-clinical control group	BDD-YBOCS, SCID-IV, Body Consciousness Questionnaire (BCQ; Miller et al., 1981)	Semi-structured interview. Participants were asked to recreate and describe their spontaneous images, including various sensory modalities. Idiographic scales measuring the characteristics of imagery.	BDD patients experienced significantly more frequent, vivid, and negative mental images of their bodies compared to controls. BDD patients' images were more likely to be viewed from an external observer’s perspective, reinforcing negative self-appraisals. Visual imagery the most common with some other modalities present.
Pascual-Vera et al. (2019)	N = 438 Mean age: Undergraduate = 24.37, Community = 40.86 Sex: M = 130, F = 308 Diagnosis: No	N/A: This study was a cross-sectional survey without any treatment or comparison groups.	None.	QUIT	The occurrence of BDD-related intrusions in clinical samples is high, often co-occurring with OCD, EDs, and health anxiety (HYP), and that these intrusions were equally distressing regardless of content.

Pascual-Vera et al. (2022)	N = 611 Mean age: 25.88 Sex: M = 122, F = 489 Diagnosis: No	N/A: This was a descriptive study exploring cultural and socioeconomic influences on appearance-related intrusions. There were no treatment or clinical comparison groups.	None.	QUIT	Unwanted mental intrusions (UMIs) related to OCD, BDD, and EDs are experienced universally across different cultures.
Van den Berg and Thompson (2007)	N = 227 Mean age: 20.47 Sex: M = 0, F = 227 Diagnosis: No	Appearance schema priming vs Non-appearance schema priming	None.	None.	Using guided imagery to experimentally induce appearance comparisons, downward social comparisons (viewing less attractive individuals) resulted in higher body satisfaction and self-confidence compared to upward comparisons.
Veale et al. (2015)	N = 90 Mean age: BDD = 42.02, SPA = 31.77, Control = 31.55 Sex: M = 90, F = 0 Diagnosis: Yes	BDD vs Subclinical Penis Anxiety (SPA) vs No concern with penis	Body Image Quality of Life Inventory (BIQoLI; Cash & Fleming, 2002), Beliefs about Penis Size (BAPS; Veale, Eshkevari, Read, et al., 2014; Cosmetic Procedure Screening Scale for BDD related to penile appearance (COPS-P; Veale et al., 2012)	None.	A significantly higher number of participants with BDD reported experiencing recurrent imagery related to their penis compared to control groups. These images fell into categories such as flashbacks, flash-forwards, and distorted self-images.
Veale et al. (2016)	N = 173 Mean age: 23.45 Sex: M = 0, F = 173 Diagnosis: No	Self-focus during mirror exposure vs External focus of attention during mirror exposure	Appearance Anxiety Inventory (AAI; Veale, Eshkevari, Kanakam, et al., 2014; Yurtsever et al., 2022), MDBSRQ - Appearance Scales	MG-CARS	The study provides support for the use of imagery as a technique in mirror-gazing exercises, although it primarily applies to practical applications rather than contributing new theoretical insights.

*This criterion was satisfied if the study includes any participants formally diagnosed with BDD. Studies passing this criterion may also contain clinical and non-clinical control participants.
**The main findings relevant to mental imagery in BDD. These may not reflect the main findings of the study overall.
***A mixed methods study wherein the table presents only the quantitative findings

Table 4

Summary of intervention studies included in quantitative synthesis.

Authors and years of publication	Population (N, age, sex, formal diagnosis* Y/N)	Intervention	Comparator(s) if applicable	Outcome measures used (BDD)	Outcome measures used (Imagery)	Imagery procedure	Main findings**
Brown et al. (1997)	N = 7 Age range: Unspecified, teenage to forties Sex: M = 2, F = 5 Diagnosis: Yes	Eye movement reprocessing and desensitisation (EMDR)	No comparison group.	Not reported.	None.	Procedure not described in article.	EMDR was effective in cases where visual mental imagery played a significant role in the disorder, although one patient who could not engage with imagery did not respond to treatment.
Dziegielewski and Wolfe (2000)	N = 1 Age: 26 Sex: M = 0, F = 1 Diagnosis: No	EMDR	No comparison group.	Body Image Avoidance Questionnaire (BIAQ; Rosen et al., 1991), Body Dissatisfaction Log	Subjective Units of Disturbance (SUD) scale. Validity of Cognition (VOC) scale.	Identified negative images in assessment stage, cognitive restructuring of the images and emotions in later stages.	Using mental imagery to guide assessment and cognitive restructuring in EMDR could be a brief and effective intervention for improving self-esteem and reducing body image disturbance in similar cases.
Ghaderi et al. (2022) - Study 2	N = 42 Age: Not reported, (range 18-45) Sex: M = 0, F = 42 Diagnosis: No	Imagery rescripting (ImRs)	Expressive writing (as an active placebo); no intervention	BSQ, Ideal Body Stereotype Scale-Revised (IBSS; Czepczor-Bernat et al., 2017)	Visual Analogue Scales (VAS) for frequency, vividness, believability, controllability, and distress.	Participants recalled the most intrusive and distressing mental image related to their body and describe its characteristics, along with triggers and personal appraisals. Once identified, participants were guided to find an "antidote" to the negative emotion and meaning associated with it.	ImRs and Expressive Writing (EW) significantly reduced the vividness, believability, negative affect, and distress associated with negative body-related images, and increased controllability, showing promising short-term effects.

Ghaderi et al. (2022) - Study 3	N = 113 Mean age: ImRs = 33.8, Expressive writing = 32.5, Waitlist = 31.9 Sex: M = 0, F = 113 Diagnosis: No	ImRs	Expressive writing (as an active placebo); no intervention	BSQ, IBSS	Visual Analogue Scales (VAS) for frequency, vividness, believability, controllability, and distress.	See Ghaderi et al. (2022) – Study 2	Both ImRs and Expressive Writing (EW) led to reductions in imagery vividness, believability and distress, additional to improving body dissatisfaction and eating disorder symptoms.
Gu and Zhu (2023)	N = 116 Mean age: 32.5 Sex: M =, F= Diagnosis: Yes	Mindfulness-based cognitive therapy (MBCT)	Treatment as usual (Unspecified pharmacological and psychosocial treatments)	BDD-YBOCS, BABP, COPS	None.	Body sensations and images evoked during mindfulness, patient encouraged to separate associated emotions. Authors described this as "imagery mediation".	MBCT is feasible and acceptable for BDD patients, with participants reporting a trend toward reduced BDD symptoms.
McKay et al. (1997)	N = 10 Mean age: 31.2 Sex: M = 4, F = 6 Age range: 21-45 Diagnosis: Yes	Exposure and response prevention (ERP)	No intervention	BDD-YBOCS	None.	Patient imagined a deformity in an exaggerated manner, providing exposure to threatening stimuli	This study demonstrated the efficacy of utilising in vivo mental imagery within ERP in treating BDD symptoms.
Pouladi et al. (2024)	N = 4 Mean age: 27.5 Sex: M = 0, F = 4 Diagnosis: Yes	EMDR	No comparison group.	BDD-YBOCS, Body Image Shame Scale (Thompson et al., 2003)	None.	In desensitisation stage, visual image of memories imagined, and bilateral stimulation to disseminate this from associated thoughts and emotions	EMDR involving mental imagery during desensitisation, significantly reduced BDD symptoms, appearance-based rejection sensitivity, and body shame, while increasing self-compassion in BDD patients.
Rabiei et al. (2012)	N = 20 Mean age: 25.2 Sex: M = 2, F = 18 Diagnosis: Yes	Metacognitive therapy (MCT)	No intervention	BDD-YBOCS, SCID-IV-TR	TFI	Using 'detached mindfulness' to separate self from thoughts and reconsider their meaning	MCT was shown to significantly reduce Thought-Fusion symptoms in BDD, with large effect sizes observed post-treatment.

Ritter and Stangier (2016)	N = 6 Mean age: 29.5 Sex: M = 1, F = 5 Diagnosis: Yes	ImRs	No comparison group.	BDD-YBOCS, SCID-IV, BDDDM, Body Dysmorphic Symptoms Inventory	Semi-structured interview adapted from previous studies. Single-item scales for distress, vividness, controllability, encapsulated beliefs (scale: 0-100).	Imagining distressing past scenario and introducing current self to provide new meaning and information to the memory.	This case series provided evidence supporting the effectiveness of ImRs for treating BDD. The ability to recall and create vivid imagery seemed to be a critical factor in determining the success of the therapy.
Sündermann et al. (2016)	N = 1 Age: 25 Sex: M = 1 Diagnosis: Yes	CBT with ImRs	No comparison group.	BDD-YBOCS, AAI, Body Dysmorphic Disorder Dimensional Scale (BDD-D; LeBeau et al., 2013).	None.	Using mental imagery to 'change' the outcome of a previous memory of sexual abuse, to "rescue" the former self	This case study showed the successful treatment of treatment-resistant BDD using CBT enhanced with emotion-focused techniques like ImRs and compassion-focused therapy.
Veale, Anson, et al. (2014)	N = 46 Median age: 30 Sex: M = 19, F = 27 Diagnosis: Yes	CBT with ImRs	Anxiety management	BDD-YBOCS, Brown Assessment of Beliefs Scale (BABS; Eisen et al., 1998), AAI, BIQoLI	None.	No description other than "Imagery rescripting followed for past aversive memories that were associated with the onset (e.g. bullying)"	CBT with ImRs was found to be significantly superior to Anxiety Management (AM) in treating BDD.
Willson et al. (2016)	N = 6 Mean age: 25.67 Sex: M = 2, F = 4 Diagnosis: Yes	ImRs	Describing imagery without intervention	BDD-YBOCS, Self-report monitoring of BDD-related preoccupation	None.	Re-entering a past scenario to alter the events in the memory, e.g. offering a hug to the past self.	ImRs improved preoccupation and distress in four out of six participants, with changes sustained for up to six months. The vividness of imagery seemed to influence the effectiveness of the intervention.

*This criterion was satisfied if the study includes any participants formally diagnosed with BDD. Studies passing this criterion may also contain clinical and non-clinical control participants.
**The main findings relevant to mental imagery in BDD. These may not reflect the main findings of the study overall.
***A mixed methods study wherein the table presents only the quantitative findings

3.2.1. Characteristics of mental imagery

Content. Most studies showed imagery exaggerated perceived flaws, especially the nose, skin, eyes, and lips (Grocholewski et al., 2018; Pascual-Vera & Belloch, 2018; Veale & Riley, 2001). Common concerns also included hair, facial hair, and body hair (Darling et al., 2015; Ghaderi et al., 2022), and overall body shape concerns such as fat distribution, muscle tone, and size (Giraldo-O'Meara & Belloch, 2018; Pascual-Vera et al., 2019). Other areas included teeth, limbs, and genitalia (Veale et al., 2015; Willson et al., 2016).

In younger adults (18-35 years), facial features concerns were most common (Veale et al., 2014; Pascual-Vera, 2017, 2021), while middle-aged adults (35-65 years) more frequently reported hair thinning and body shape concerns, reflecting age-related concerns (McKay et al., 1997; Ritter & Stangier, 2015). Gender differences were evident: males focused on muscle tone, hair thinning, and genitalia (Ritter & Stangier, 2015; Veale et al., 2016; Brown et al., 1997), while females focused on breasts and genitalia (Willson et al., 2015; McKay et al., 1997). Women more frequently focused on multiple body parts than men (Ritter & Stangier, 2015; Giraldo-O'Meara, 2018).

Imagery often involved comparing distorted self-images to idealised versions of their self or others (Willson et al., 2015; Veale et al., 2014), contributing to body dissatisfaction (Onden-Lim & Grisham, 2012b). A cross-cultural study across Israel, Turkey, Iran, Italy, Portugal, Spain, and Argentina found no major differences in imagery content, though slight variations reflected local attitudes toward gender, appearance, religion, and migration (Pascual-Vera, 2021).

Intensity. Participants with BDD or high BDD symptomology consistently reported more intense imagery (frequent, vivid, intrusive, distressing) than non-clinical groups (Pascual-Vera, 2017; Chuah & Suendermann, 2024). Though 91.9% of non-clinical samples

reported at least one intrusive appearance-related image (Giraldo-O'Meara & Belloch, 2019), this was lower than in BDD samples (Giraldo-O'Meara & Belloch, 2018, 2019). Intensity appeared higher in younger individuals, although age effects were less robust after controlling for BDD severity (Pascual-Vera & Amparo, 2019; Chuah & Suendermann, 2024). Most studies reported similar imagery intensity across genders, though one study found women experienced higher intensity (Giraldo-O'Meara & Belloch, 2019).

Generation. Triggers for intrusive imagery included negative body image appraisals, anticipating social events (Darling et al., 2015; Willson et al., 2016), mirror-gazing (Veale et al., 2016), and social comparisons (Liu et al., 2023). Imagery was more likely during heightened emotional arousal, especially anxiety (Onden-Lim & Grisham, 2012b; Farrar et al., 2014). Deliberately evoked imagery was also common, whether under personal control or as part of interventions like exposure (McKay et al., 1997), ImRs (Willson et al., 2016), in vivo replication of body-focused behaviours (e.g. mirror-gazing; Veale et al., 2016), or body image rumination (Hamamoto et al., 2024).

Sensory modality. Imagery was predominantly visual, with only one study reporting auditory, internal, and tactile imagery (Osman et al., 2004). This bias likely reflects studies measuring only visual imagery (Moreno-Domínguez et al., 2012, Farrar et al., 2015, Darling et al., 2015), and outcome measures only assessing visual imagery (Pascual-Vera, 2021; Giraldo-O'Meara & Amparo, 2019).

Emotional impact. Imagery was consistently reported as negative in emotional tone (Veale et al., 2014; Sundermann et al., 2016; Pascual-Vera & Amparo, 2017), increasing anxiety (Pascual-Vera, 2021; Van Den Berg, 2006), depressive symptoms (Farrar et al., 2014; Veale et al., 2016; Hamamoto et al., 2024), shame (Brown et al., 1997), and body dissatisfaction (Hamamoto et al., 2024; Liu et al., 2023; Moreno-Dominguez et al., 2011).

Behavioural response. The emotional impact of imagery prompted behaviours like rumination (Pascual-Vera & Amparo, 2017), imagery suppression (Onden-Lim & Grisham, 2012), among hallmark BDD safety-seeking behaviours (Veale et al., 1996; 2004a). BDD samples more consistently engaged in safety-seeking behaviours such as mirror-checking and camouflaging than non-clinical samples (Veale et al., 2015; Ritter & Stangier, 2015). Intrusive imagery appears to worsen daily functioning, particularly in social interactions, work performance, and self-esteem (Sundermann et al., 2016; Rabiei et al., 2012). Although societal pressures and gender norms were mentioned (Giraldo-O'Meara & Belloch, 2018, 2019; Veale et al., 2015), no study directly measured them. Evidence suggests women more often use multiple coping strategies, and thought control techniques like distraction and neutralising thoughts (Giraldo O'Meara, 2018), whereas men more consistently used mirror-checking, grooming and posturing (Veale et al., 2016).

3.2.2. Interventions

Various imagery-based interventions, of variable but generally lower quality and summarised in Table 5, aimed to enhance understanding of imagery's role in BDD maintenance and resolution. These approaches were theoretically grounded, suggesting hypotheses about imagery-related mechanisms underlying BDD. However, no studies directly tested these hypotheses, leaving them speculative.

Table 5

Brief description of imagery-based interventions in included studies.

Intervention	Summary	Imagery component in BDD	Hypothesised imagery-related mechanism	N, studies
Imagery rescripting (ImRs) – either stand alone or with cognitive-behavioural therapy (CBT)	Changes negative meanings of imagery from aversive memories.	Engages with and alters distressing memories. E.g. memory of being bullied for facial defect is attached to the meaning that the person feels worthless. This is changed to a new meaning (e.g. they just wanted to talk to me) by changing the image content (e.g. it was said in a positive tone).	Autobiographical memories and their understood meanings maintain BDD symptoms, and can be retrieved from memory as accessible mental images or appear intrusively. Changing the content of imagery therefore can target symptomology.	5, Ghaderi et al., 2022; Ritter & Stangier, 2016; Sündermann et al., 2016; Veale, Anson, et al., 2014; Willson et al., 2016
Exposure and response prevention (ERP)	Gradual exposure to feared stimuli without performing safety behaviours	Imagined generation of feared stimuli by simulation of feared scenarios (e.g body being viewed by another); to reduce avoidance and distress (e.g. not posturing or looking away).	Avoidance of imagery facilitates further anxiety and negative interpretations related to the imagery content. Exposure without safety-seeking behaviour interrupts this cycle.	1, McKay et al., 1997
Eye movement reprocessing and desensitisation (EMDR)	Processes trauma or stressful images using bilateral stimulation to reduce emotional distress	Imaginal generation of distressing memories and images related to BDD (e.g. memory of being bullied about appearance) while performing bilateral stimulations (e.g. performing horizontal eye movements while following the therapist's fingers).	Negative quality and appraisals of imagery are related to how they are processed (encoded, stored and retrieved). EMDR reprocesses the memory and desensitises the person to its content through imaginal generation.	3, Brown et al., 1997; Dziegielewski & Wolfe, 2000; Pouladi et al., 2024
Metacognitive therapy (MCT)	Targets dysfunctional beliefs about own thinking processes	Examines and targets negative beliefs (e.g. I am worthless because I am unattractive) about the appraisals and behavioural use of imagery (e.g. if I keep thinking about how unattractive I am, I might find a solution).	Beliefs about engaging in imagery processes are associated to negative qualities of imagery and the perpetuation of safety-seeking behaviours. Changing beliefs about imagery may disrupt this process.	1, Rabiei et al., 2012
Mindfulness based cognitive therapy (MBCT)	Uses cognitive defusion and mindfulness techniques to help clients disentangle mental imagery from its perceived meaning	The client is encouraged to engage with mental imagery rather than avoid it (e.g. be aware of distorted body parts) and recognise this as an internal experience rather than a reflection of reality	Cognitive fusion between mental imagery and its perceived meaning perpetuates BDD symptoms; mindfulness-based techniques promote decoupling of imagery from meaning	1, Gu et al., 2023

ImRs. The three studies using ImRs as a standalone intervention were generally high quality, and demonstrated efficacy in reducing imagery vividness, emotional impact, and improving BDD symptoms (Ghaderi et al., 2022; Ritter & Stangier, 2016; Willson et al., 2016). Two studies also found CBT with ImRs effective in reducing BDD symptoms (Sündermann et al., 2016; Veale, Anson, et al., 2014). These studies suggest early negative appearance-related experiences form associations between negative appraisals of body image and related experiences. ImRs targets distressing memories by rescripting them to reduce emotional impact. Although one case study reported significant changes in beliefs through ImRs (Willson et al., 2015), changes in cognitive beliefs were not consistently assessed.

ERP. One study, of poor-quality, used ERP with imaginal exposure to perceived flaws to reduce negative emotions and prevent safety-seeking behaviours (McKay et al., 1997). Grounded in traditional exposure models, it proposed that repeated confrontation with feared stimuli leads to habituation and reduced distress. Although not framed in terms of inhibitory learning, later theories suggest imaginal exposure may weaken threat associations and build distress tolerance. ERP aims to extinguish beliefs, increase distress tolerance, and test assumptions through repeated exposure without safety-seeking behaviours. Despite underreporting, this study demonstrated an early application of imagery exposure principles for BDD, drawing from anxiety disorder treatments (Ferrando & Selai, 2021).

EMDR. Three studies indicate EMDR can reduce BDD symptoms by reprocessing past memories and their links to future-focused images of perceived flaws, using bilateral stimulation (Brown et al., 1997; Dziegielewski & Wolfe, 2000; Pouladi et al., 2024). Study quality varied from good to poor. Pouladi et al. (2024) reported a 60.5% reduction in symptoms, while others only claimed effectiveness subjectively. EMDR is theorized to work by reprocessing distressing memories and disrupting working memory involved in imagery

generation (Van den Hout & Engelhard, 2012). However, such mechanisms were not directly tested.

MCT. One study, of low-quality, reported reduced BDD symptoms through MCT (Rabiei et al., 2012), which targets beliefs sustaining preoccupation (e.g., "If I keep thinking about my appearance, I will find a solution") rather than altering image content. It provides preliminary evidence linking BDD severity, maladaptive beliefs, thinking processes, and beliefs about imagery. Further research is needed to clarify imagery's role in metacognitive approaches to BDD.

MBCT. One study (Gu et al., 2023) found MBCT more effective than standard pharmacological and psychosocial interventions for reducing BDD symptoms, with high quality ratings. Like MCT, MBCT addresses imagery indirectly, focusing on present-moment awareness and decentring rather than altering image content or mirror-gazing. These techniques aim to enhance sensory focus and reduce evaluative self-referential processing. The study suggests avoidance or suppression may worsen negative self-referential processing. More research is needed to clarify MBCT's effect on imagery-related distress in BDD.

3.3. Qualitative synthesis

Eight studies were included in the qualitative synthesis (see Table 6), examining intrusive imagery (Osman et al., 2004; Ghaderi et al., 2022; Onden-Lim & Grisham, 2012), metacognition (Cooper & Osman, 2007), BDD origins and experiences (Craythorne et al., 2022; Brennan et al., 2023), perceptions of younger selves (Silver & Reavey, 2010), and intimate relationships (Stechler & Henton, 2022). No qualitative studies explored experiences of imagery-based interventions or perceived mechanisms of change.

Table 6

Summary of studies included in the qualitative synthesis.

Authors	Population (N, age, sex, formal diagnosis* Y/N)	Comparison groups, treatment and/or clinical group (if applicable)	BDD measure	Mental imagery measure	Main findings**
Cooper and Osman (2007)	N = 18 Mean age: 27.5 Sex: M = 9, F = 9 Diagnosis: Yes	BDD participants. No group comparisons.	SCID-IV	Semi-structured interview. Participants identified an image related to concerns about appearance, described it in detail, and answered questions about metacognition.	BDD patients frequently experienced negative body-related images, leading to negative self-judgments, with many relying on coping strategies such as distraction and avoidance. Images were often linked to early memories and mirror-gazing, reinforcing negative appraisals of their appearance.
Craythorne et al. (2022)	N = 8 Mean age: 32.13 Sex: M = 2, F = 6 Diagnosis: No (Some participants were in the process of getting a diagnosis)	BDD participants. No group comparisons.	BDDQ	None. Mental imagery emerged organically as a theme from semi-structured interviews about self-identified origins and experiences of BDD.	Participants reported experiencing negative self-appraisals that were linked to appearance-focused bullying from a young age. The imagery associated with these experiences led to ongoing self-criticism and negative perceptions of their appearance, reinforcing feelings of shame and distress.
Ghaderi et al. (2022)- Study 1***	N = 31 Mean age: 27.8 Sex: M = 0, F = 31 Diagnosis: No	Individuals high in body dissatisfaction. No group comparisons.	BSQ, IBSS	Semi-structured interview on content of mental imagery.	Imagery can be positive or negative in emotional tone, but especially negative in the context of greater body dissatisfaction.
Onden-Lim and Grisham (2013)	N = 65 Mean age: 19.32 Sex: M = 10, F = 55 Diagnosis: No	Individuals with high dysmorphic concern. No group comparisons.	BICI	Semi-structured interview adapted from Osman et al. (2004). Participants described their most frequent recurrent image and answered questions about the content, context, and quality.	Participants reported frequent intrusive imagery related to body concerns, with negative imagery often reflecting social situations or self-comparisons. Attempts to suppress these images were more common in BDD, but no direct link to image frequency or vividness was observed.
Osman et al. (2004)***	N = 36 Mean age: 27.5 Sex: M = 18, F = 18 Diagnosis: Yes	BDD vs non-clinical control group	BDD-YBOCS, SCID-IV, BCQ	Semi-structured interview. Participants were asked to recreate and describe their spontaneous images, including various sensory modalities. Idiographic scales measuring the characteristics of imagery.	Images in BDD were often linked to stressful early memories, including bullying. The images may be reconstructions of the memories themselves, or novel generated images around the same themes as the early stressful memories.

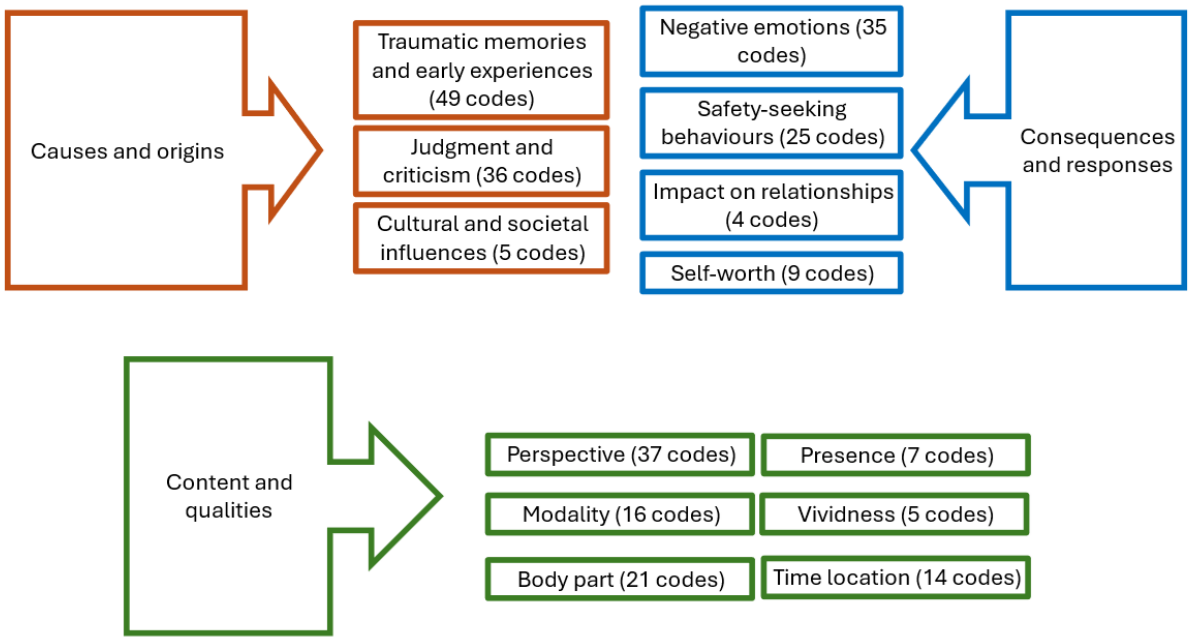
Silver and Reavey (2010)	N = 11 Mean age: Not reported Age range: 20–39 Sex: M = 7, F = 4 Diagnosis: Yes	BDD participants. No group comparisons.	Self-report diagnosis only	Semi-structured interview. Participants were asked to bring photographs to prompt imagery and memories; discussed photographs and drew a picture of themselves.	When purposefully generated mental imagery of their perceived past selves, individuals view their past selves in idealistic manners and lament the loss of that appearance and meanings attached to more youthful appearance, demonstrating a role of self-objectification in the negative appraisals associated with BDD.
Stechler and Henton (2022)	N = 6 Mean age: Not reported Age range: 21–33 Sex: M = 0, F = 6 Diagnosis: Yes	BDD participants. No group comparisons.	Self-identification with BDD, self-report diagnosis of BDD	None. Mental imagery emerged organically as a theme from semi-structured interviews about phenomena of BDD and physical intimacy.	Participants reported using their partners' imagined view of their bodies to critically appraise their appearance, leading to distress. Negative comparisons with idealised images of other women contributed to dissociative experiences during intimate moments, further disrupting intimate experiences.
Brennan et al. (2023)	N = 12 Mean age: Not reported Age range: 19–64 Sex: M = 5, F = 7 Diagnosis: Yes	BDD participants. No group comparisons.	BDD-YBOCS, BDDDM, MINI International Neuropsychiatric Interview	None. Mental imagery emerged organically as a theme from semi-structured interviews about lived experience of BDD.	Individuals with BDD frequently experience distressing mental imagery related to their body, often on specific body parts like skin, hair, and facial features. Images were often seen from an observer's perspective, contributing to feelings of objectification and hyper-awareness in public.

*This criterion was satisfied if the study includes any participants formally diagnosed with BDD. Studies passing this criterion may also contain clinical and non-clinical control participants.
**The main findings relevant to mental imagery in BDD. These may not reflect the main findings of the study overall.
***A mixed methods study wherein the table presents only the qualitative findings

Thematic synthesis led to generation of three analytical themes: (1) causes, (2) content; (3) consequences and/or maintenance patterns, shown graphically in Figure 3. These were derived from 263 initial codes and 13 descriptive themes, detailed in Appendix D.

Figure 3

Analytical and descriptive themes from thematic synthesis.



3.3.1. Causes

Early life experiences, particularly appearance-related criticism or comparison, were often linked to BDD onset in those experiencing intrusive imagery (Craythorne et al., 2022; Osman et al., 2004). Common triggers included bullying or negative remarks from peers, family, or influential figures: *"I do remember in detail how he teased me…it is vivid in my mind during and after"* (Craythorne et al., 2022). These experiences typically occurred between ages 7-15 (Craythorne et al., 2022; Silver & Reavey, 2010), when self-consciousness around appearance were highest (Brennan et al., 2023). Cultural and familial pressures around appearance were also significant, with participants describing pervasive appearance-

related judgment and criticism throughout childhood: *"I remember getting shamed often, in comparison to other kids of my age, my cousins and friends"* (Craythorne et al., 2022).

3.3.2. Content

Imagery modality was predominantly visual but could include auditory and tactile elements, with gustatory and olfactory experiences being rare (Osman et al., 2004; Onden-Lim & Grisham, 2013). Imagery was usually from a third-person perspective (Brennan et al., 2023; Ghaderi et al., 2022), creating a sense of disconnection from one's body (Stechler and Henton, 2022). Images often zoomed graphically on perceived flaws, most commonly skin, hair, and facial features (Cooper & Osman, 2007; Osman et al., 2004) in an exaggerated manner (Brennan et al., 2023). The emotional tone was overwhelmingly negative, evoking shame, anxiety, and disgust (Stechler & Henton, 2022; Craythorne et al., 2022).

Imagery also involved self-comparisons to preferred or idealised aesthetic standards (Stechler & Henton, 2022) or scenarios where family members, peers, or romantic partners were critically evaluating them (Stechler & Henton, 2022; Cooper & Osman, 2007). Imagery could be static snapshots, slideshows and videos (Osman et al., 2004; Silver & Reavey, 2010) and depicted past memories, current situations, or purely imagined scenarios (Silver & Reavey, 2010; Onden-Lim & Grisham, 2013).

3.3.3. Consequences and maintenance patterns

Imagery of memories and future scenarios was easily and vividly generated, causing distress during interviews (Brennan et al., 2023; Stechler and Henton, 2022). Significant past experiences continued to fuel feelings of inadequacy and preoccupation with perceived flaws, (Brennan et al., 2023; Onden-Lim & Grisham, 2013), with recurrent imagery maintaining their emotional impact (Craythorne et al., 2022).

The negative emotional tone of imagery was driven by activation of negative appearance-related appraisals, which heightened attention, vividness and persistence (Cooper & Osman, 2007). This attention increased ruminative thoughts (e.g. *"Do they think I'm ugly?"*), furthering attention and establishing a ruminative maintenance cycle (Stechler & Henton, 2022; Craythorne et al., 2022).

Safety-seeking actions such as hiding or camouflaging perceived flaws were common during and following imagery experiences. Individuals imagined what others saw using third-person imagery, using this to guide their concealment efforts (Onden-Lim & Grisham, 2013; Brennan et al., 2023), or motivate avoiding situations (Stechler & Henton, 2022).

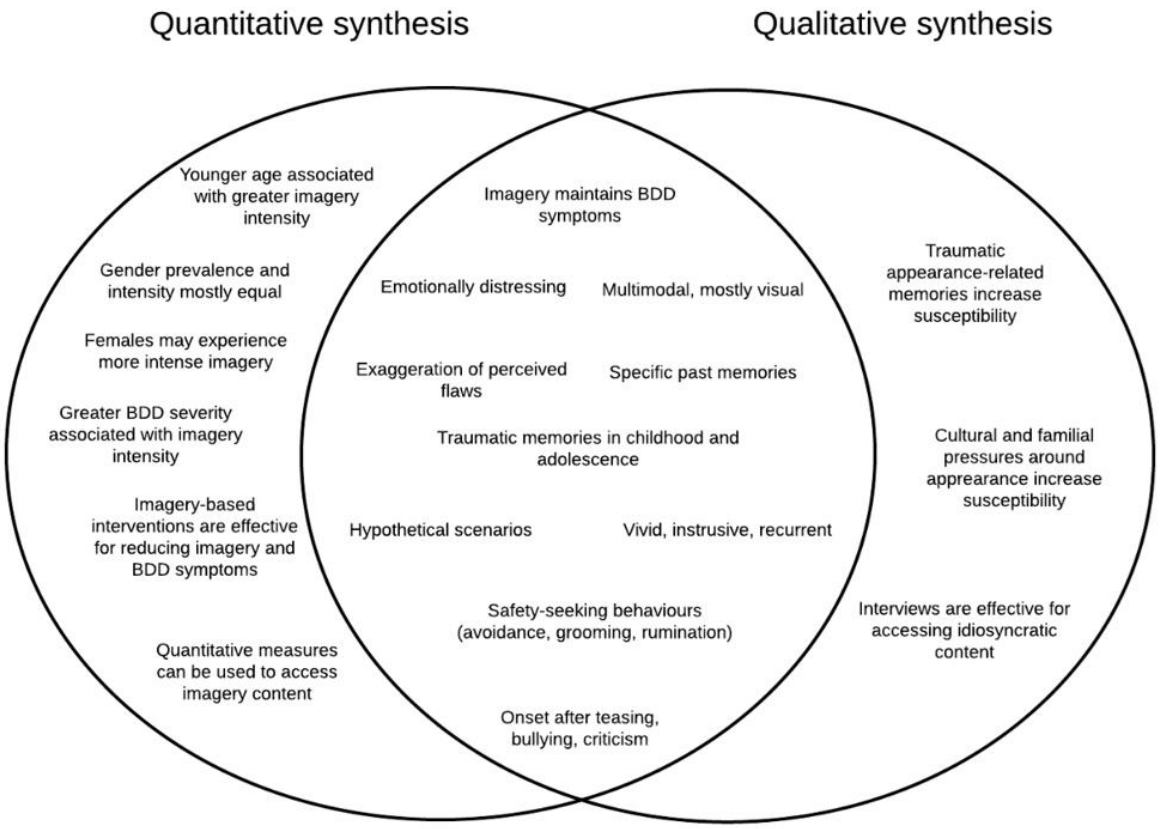
As withdrawal and avoidance accumulated, behavioural responses to imagery became more sophisticated, increasingly disrupting daily functioning, social interactions, concentration, and routine tasks (Cooper & Osman, 2007; Brennan et al., 2023). Feelings of self-judgment, hopelessness, and emotional detachment were common, particularly when individuals felt trapped in negative self-perception cycles. Repeated withdrawal reinforced negative appraisals, reduced self-esteem, and maintained distressing imagery cycles over time (Stechler & Henton, 2022).

3.4. Meta-integration

Overlapping and unique contributions of both syntheses, displayed graphically in Figure 4, were organised into characteristics and hypothesised mechanisms.

Figure 4

Graphical representation of the contributions of both syntheses.



3.4.1. Characteristics

Both datasets characterised mental imagery in BDD as distressing, vivid, intrusive and recurrent, involving distorted bodily perceptions rooted in past memories or hypothetical scenarios, usually from a third-person perspective. Both datasets strongly linked these variables to anxiety, shame, and disgust, and maladaptive behaviours like avoidance and mirror-checking.

Both data sets complemented in imagery being primarily visual, with occasional auditory, tactile, and internal representations (Osman et al., 2004). Since BDD preoccupations often focus on perceived aesthetic flaws, visual imagery is most common. However, concerns about bodily function and ability may involve other modalities (e.g., touch, physical pain).

Individual differences were explored primarily within the quantitative dataset. The frequency, recurrence, vividness and intrusiveness of imagery appears to be positively associated with BDD severity and younger age. Ethnic and gender differences in imagery appear to predominantly concern the specific content of imagery, and the cultural or societal standards associated with these demographics, rather than the phenomenological qualities of imagery itself. In this sense, the images' content reflects motivational concerns of the individual in meeting certain socially-approved, culturally-informed aesthetic standards.

3.4.2. Hypothesised mechanisms

Imagery as a maintenance factor in BDD. Both datasets indicated that intense imagery is linked to maladaptive behaviours perpetuating BDD symptoms and further imagery. Intrusive imagery appeared to be triggered acutely by heightened negative emotions, especially anxiety, shame and disgust, anticipating social events and during social comparisons. Imagery activated negative self-appraisals and self-focused attention, furthering negative emotions and prompting behavioural responses.

Imagery as a potentially vulnerability factor for BDD. Quantitative data suggested greater imagery intensity in BDD and high-risk non-clinical samples, implying a continuum where imagery intensity increases with BDD severity. This complements suggestions from several studies in both datasets (Giraldo-O'Meara & Belloch, 2018; Liu et al., 2023; Onden-Lim & Grisham, 2013) that imagery contributes to BDD's onset, not just its maintenance. Yet, as studies were retrospective without control conditions, causality cannot be established. Some individuals may be more prone to maladaptive responses to vivid, emotional, and recurrent imagery about body concerns, while being less attuned to adaptive imagery functions (e.g., problem-solving, positive self-concept), increasing vulnerability to BDD.

Traumatic early experience as an aetiological risk factor for imagery. The qualitative synthesis suggests traumatic and/or impactful early experiences related to body image increase susceptibility to distressing intrusive imagery (Section 3.3.2) and BDD. Although previous reviews have proposed links between trauma history and BDD onset (Longobardi et al., 2022), it remains unclear whether trauma increases susceptibility to distressing imagery, thereby contributing to BDD.

Imagery as a modifiable treatment target in BDD. The quantitative synthesis demonstrated imagery-based interventions, either targeting imagery directly (e.g., ImRs) or indirectly (e.g., MCBT, MCT), effectively reduced imagery intensity and BDD symptoms. Accessing imagery content may help identify the origin, nature, and maintenance of BDD preoccupations (Stechler & Henton, 2022; Silver & Reavey, 2010), and aid in reprocessing negative appraisals (Ghaderi et al., 2022; Pouladi et al., 2024). As such, both datasets suggest imagery's relevance for developing formulations and guiding treatment, but further research is needed to clarify mechanisms of change.

4. Discussion

This review aimed to synthesise the evidence on the nature of mental imagery in BDD, and the mechanisms of imagery in BDD development, maintenance and amelioration. The present meta-integration indicates imagery as a multimodal (though predominantly visual), recurrent, and intrusive aspect of BDD symptomology. Imagery is typically of the self, viewed from a distorted, critical and third-person perspective, often comprising specific early experiences, or present/future hypothetical scenarios involving appearance-related criticism. The content appears to reflect perceived body flaws, negative appraisals about these flaws, societal and cultural meanings attached to flaws (Pascual-Vera et al., 2022), and may therefore present a mental representation of the key psychological experiences relevant to one's presentation, and potentially, treatment targets.

Imagery intensity (as captured by vividness, negative emotion, intrusiveness and recurrence) appeared to positively associate with higher BDD severity, and heightened emotional states, engendering self-focused attention (Brennan et al., 2023; Osman et al., 2004). Although intense imagery is present in the general population, attention, interpretations and behavioural responses to imagery appeared to be more impairing in those with BDD (Giraldo-O'Meara & Belloch, 2018). As such, intense mental imagery may be a somewhat distinguishing feature when comparing clinical and non-clinical presentations of BDD, although no clear-cut boundary between normal and disorder can be discerned, at least based on intensity. The available evidence complements cognitive-behavioural frameworks of mental imagery in BDD, wherein self-relevant imagery is maintained and intensified by negative body-focused appraisals, negative emotions and behaviours intended to reduce distress (Cooper & Osman, 2007).

4.1. Clinical implications

Imagery-based interventions for BDD appear feasible and effective, with techniques like EMDR, ImRs, and ERP reducing BDD severity and imagery intensity (Ghaderi et al., 2022). Combining these with interventions such as CBT, MBCT, and MCT can further address negative appraisals, emotional dysregulation, and maladaptive behaviours that sustain imagery intensity (Gu & Zhu, 2023). However, more research is needed to clarify how these interventions affect imagery and whether this underpins treatment effectiveness.

Early appearance-related judgment and criticism can generate vivid, intrusive imagery persisting into adulthood, serving as a core mechanism in BDD maintenance and possibly onset (Craythorne et al., 2022; Osman et al., 2004). This suggests a pathway for identifying individuals at risk of developing BDD. Novel screening tools targeting those with trauma histories and intrusive appearance-related imagery could enable early intervention. Applying quantitative imagery tools (e.g., AIQ, QUIT) for screening could be a useful starting point.

Adolescence, characterized by heightened self-consciousness and self-image formation (Phillips, 2017), may be an ideal time for preventative strategies. Despite promising evidence for imagery-based interventions in adults, their use in adolescents and older adults remains unexplored.

4.2. Research limitations and future directions

More consistent use of imagery and BDD measures across studies, using representative samples, would improve quality, homogeneity and comparability of this evidence base. Further application and psychometric validation of quantitative imagery measures, such as the AIQ and QUIT, and manualised versions of semi-structured imagery interviews, would improve measurement issues.

Most studies focused on adults in their country of origin, with few comparing demographics. Lived experience data on imagery in BDD from minoritised groups, such as ethnic minorities, 0-18 and 65+ age groups, transgender populations, and demographic differences (e.g., gender, age, ethnicity, culture), are notably neglected. Studies also focused heavily on visual imagery, in neglect of other modalities (e.g. tactile, auditory). Finally, beyond intrusive imagery, it would be important to understand the impact of deliberately-generated forms of BDD-relevant imagery. Research into imagery in mental activities such as problem-solving in social settings, accessing and interpretating memories and other novel settings may enrich the mechanistic understanding of mental imagery in BDD psychopathology.

4.3. Limitations of this review

There was notable heterogeneity between studies, especially regarding BDD and imagery measurement, procedures for generating/utilising imagery, reporting of data and study quality. These inconsistencies precluded pooling trends and effect sizes, limiting our

analysis to narrative methods of synthesis. The intervention studies alluded to mechanisms but were mostly focused on efficacy, so are unable to be conclusive about why and how imagery is related to BDD. Finally, the available evidence provides preliminary indication that demographic and contextual differences in imagery characteristics are subtle but important, however this claim cannot be conclusive as no available studies explored content or mechanistic differences in BDD imagery cross-culturally.

4.4. Interpretation

This systematic review highlights the central role of mental imagery in maintaining and potentially contributing to the onset of BDD. Despite methodological inconsistencies, the meta-integration consistently characterized imagery in BDD as vivid, intrusive, distressing, and primarily reflecting negative self-perceptions and body appraisals. Imagery content often related to the onset and progression of perceived flaws, particularly influenced by early appearance-related criticism and the cultural or familial context in which it occurred. Imagery also appears an accessible target for psychological interventions, prompting a need for early detection and intervention, particularly for individuals with trauma histories and/or in adolescence, where susceptibility to BDD imagery appears greatest. Greater demographic diversity across studies, especially in minoritised groups and across the lifespan, consistency in measurement of both imagery and BDD severity, and mechanistic tests in intervention studies, are key areas for further research.

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Service Improvement Project

Outcome monitoring in an adult inpatient eating disorders unit: A service improvement project for Cotswold House

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Word count: 5169 (5069 + 1 table counted as 100 words)

Target Journal: International Journal of Eating Disorders. This journal publishes various articles related to eating disorders, including advancements in service and psychometric development. Guidance for authors available in Appendix E.

Declaration of competing interest: None.

Abstract

Objective: The Eating Disorder Examination Questionnaire (EDE-Q) and Clinical Impairment Assessment (CIA) are widely applied for measuring eating disorder psychopathology, but experience problems when applied in inpatient services. This service improvement project aimed to adapt the EDE-Q and CIA psychometric measures to be applicable to Cotswold House, an adult inpatient service, trial the adapted measures and gain feedback from patients.

Method: We used qualitative feedback from staff, patients and experts by experience to develop adapted versions of the EDE-Q and CIA. 12 patients at Cotswold House trialled the measures for a six-week period. Semi-structured interviews (*N=9*) gained qualitative data on patients' views on the adapted measures, from which themes were analysed using the framework method.

Results: Patients spoke positively about the adapted measures, especially the shorter time frame and the removal and adaptation of questions to better fit their experience. Recommendations for Cotswold House, including the adapted measures, were generated.

Discussion: Our findings demonstrate feasibility and substantial clinical benefit to developing validated inpatient versions of the measures, which may motivate psychometric validation of the EDE-I and CIA-I. Adapting the measurement process demonstrably enhanced patient experience and increased the utility of psychometric data compared to the original measures.

Public significance statement: This study uses first-person accounts of staff, patients and experts by experiences to punctuate the need for adapting the EDE-Q and CIA to inpatient

services, together with a demonstration of feasibility in adapting the measures. This adds to the growing literature of adapting eating disorder measures to improve services.

Keywords: eating disorders, outcome measures, inpatient, service improvement, mental health

1. Introduction

1.1. Eating Disorders

Eating disorders (EDs) are complex psychiatric illnesses characterised by abnormal eating behaviours and a preoccupation with body weight, shape and image (DSM-5, American Psychiatric Association, 2013; ICD-11, World Health Organization, 2021). EDs are associated with severe physical and psychological outcomes, including repeated psychiatric admission and excess mortality (Smink et al., 2012). An estimated 1.6 million people in the UK will be affected by an ED in their lifetime (Demmler et al., 2020), with incidence of diagnosis rising rapidly in recent years (Trafford et al., 2023).

A transdiagnostic cognitive-behavioural model of EDs (Fairburn et al., 2003) posits that all EDs share distinctive clinical features, expressed as similar attitudes and behaviour regarding over-evaluation and control of eating, shape and weight. The model proposes an integrated framework of EDs across all diagnoses, acknowledging their shared underlying mechanisms and treatment approaches. The model considers four key maintenance processes above the diagnostic ED psychopathology: (1) clinical perfectionism; (2) core low self-esteem; (3) mood intolerance; (4) interpersonal difficulties, to be considered within treatment. Together, the transdiagnostic approach offers a comprehensive framework for understanding and treating EDs, and is foundational to many current interventions (Fairburn et al., 2015) and psychometric tools (Burton et al., 2016).

1.2. Outcome Monitoring in ED Services

Measurement and monitoring of outcomes and progress in mental health service users is essential for constructing and evaluating treatment plans, tracking symptom change, and ensuring safety. Choice of measures should be based on relevance to the goals of the individual and the service context they are delivered (Law & Jacob, 2013). Psychological

assessment through standardised and idiographic instruments has been largely recognised as an important part of treatments for both inpatient and outpatient settings (Gibbons et al., 2021). NHS England (2020) and the National Institute for Health and Care Excellence (2017) provide guidance on outcome monitoring for ED services. These recommend the use of the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) and Clinical Impairment Assessment questionnaire (CIA; Bohn & Fairburn, 2008) at all stages of an individual's treatment pathway. It is recommended to employ relevant measures every two weeks in intensive settings where possible (Austin et al., 2023).

1.3. EDE-Q and CIA

The EDE-Q (Fairburn & Beglin, 1994; 2008) is a 28-item self-reported questionnaire assessing the presence and severity of ED symptoms. Twenty-two items encompass four subscales, matching the four cognitive-behavioural processes in the transdiagnostic model of ED (Cooper & Fairburn, 1987): dietary restraint (5 items), eating concern (5 items), weight concern (5 items) and shape concern (8 items). The remaining 6 items (items 13-18) ask about nominal frequency of specific eating behaviours such as laxative use and excessive exercise. All items ask respondents to consider the last 28-day period. The mean scores on each subscale are combined to obtain the global score, which provides an overall measure of ED symptoms (Appendix F).

The CIA (Bohn & Fairburn, 2008) is a 16-item self-report measure of psychosocial impairment due to ED features (Appendix G). It assesses impairment in cognitive function, emotions and relationships. The CIA was designed to be used alongside the EDE-Q, acknowledging that functional impact is an additional crucial aspect to ED treatment (Bohn et al., 2008) and thus shares the EDE-Q's theoretical basis.

Questions and subscales for both measures were conceptualised, generated, and validated using outpatient community samples, without representation of inpatients (Fairburn & Beglin, 1994). This can be problematic, as both questionnaires contain items about restricted and/or infeasible behaviours in inpatient settings. For example, the EDE-Q contains questions about over-exercising and laxative use; the CIA contains questions about work performance and eating out with family and friends. Such items compromise the validity and utility of the measures in inpatient settings. Asking these questions may also generate a sense of dejection and distress in inpatient service users, potentially harmful to their welfare (Bull et al., 2019).

There have been earlier adaptations of these measures for different groups. The EDE-Q–Short Version (EDE-QS; Gideon et al., 2016) and adolescent version (EDE-A; Carter et al., 2001) are two examples. The EDE-A was adapted by combining empirical data on adolescent functioning and consultation with clinicians. The EDE-QS sought to make the EDE-Q more appropriate for frequent, sessional measurement, using data reduction techniques. Based on these examples, there is promising scope to adapt the EDE-Q and CIA for inpatient services.

1.4. Service Context

Cotswold House is a 14-bed hospital in Oxford Health NHS Foundation Trust, providing inpatient and day patient treatment for adults with EDs who cannot be safely treated in the community. Patients can be admitted voluntarily or formally under the Mental Health Act (MHA). Treatment typically includes dietetic and nursing support, meal support and weight restoration, occupational therapy and psychological treatment. The EDE-Q and CIA are administered every six weeks on the ward, and additionally on admission, transition to day patient from inpatient, and discharge.

Patients raised concern and frustration that several items on the EDE-Q and CIA felt inappropriate or irrelevant to them in an inpatient environment. When consulted on this in June 2022, patients highlighted (1) items are about behaviours not possible in the ward environment; (2) the measures use an unsuitably long timeframe (28 days), (3) are lengthy to complete regularly, and (4) being asked irrelevant items felt distressing and demoralising. They stated, *"Questions 13, 14 and 15 [of the EDE-Q] are not useful for inpatients because [we?] have to eat a lot regardless"; "Question 19 [of the EDE-Q] is not useful because we can't eat in secret"; "several of the [CIA] questions are triggering…being an inpatient is hard enough without being reminded of the impact on our lives".* Staff shared similar views, citing lack of access to items such as laxatives, opportunity for overexercising or overeating, or purging due to toilets being locked after all meals and snacks. One healthcare assistant stated, *"I am not sure [EDE-Q items 9,10,11,12,13] would apply as they are already on a specific meal plan".*

Considering the concerns identified and the previous successful adaptations of the EDE-Q, this project sought to improve the utility of measures at Cotswold House by adapting versions of EDE-Q and CIA for inpatient use, in consultation with staff and individuals with lived experience of the service. Following review of the service pathways, adaptations allowing for bespoke, inpatient-specific, frequent monitoring during routine inpatient care, while remaining grounded in the cognitive-behavioural model of EDs, were indicated.

2. Method

2.1. Sample

All current and newly-admitted service users of Cotswold House between September 2023 to April 2024 were identified for potential inclusion with no exclusion criteria, including inpatient and day care patients. 16 patients were invited to take part, of which 12

(F=11, M=1) consented to trial the newly-adapted measures and were provided an information sheet. Of those, 9 *(F=9, M=0)* completed the follow-up interview. Two interviews were completed by currently discharged patients, and seven by current admissions. Two patients (P2, P7) were involved in both initial development of the measures and trialling the measures. Full demographic details are presented in Table 7.

Table 7

Sample demographics.

Identifier	Age, years	Sex	Diagnosis (DSM-V)	Status during interview	Approx. stay at service, months	EDE-Q prior*	Admission BMI	Part of project develop-ment
P1	24	F	AN	Inpatient	5.79	1.4	13.8	No
P2	29	F	AN	Discharged	3.95	5.7	19.7	Yes
P3	31	F	AN	Inpatient	2.96	4.62	14.6	No
P4	39	F	AN	Inpatient	3.42	NA	15.2	No
P5	24	F	AN	Inpatient	4.87	NA	15.9	No
P6	21	F	AAN	Inpatient	2.79	5.0	17.4	No
P7	51	F	AN	Discharged	3.45	4.2	15.6	Yes
P8	48	F	AN	Inpatient	5.82	NA	13	No
P9	59	F	AN	Inpatient	5.75	NA	14.9	No
N=9	M=36.2, S.D=13.7				M=4.31, S.D=1.58	M=4.18, S.D=2.73	M=15.57, S.D=3.97	

**The earliest available EDE-Q score for them as an inpatient from the project start date; AN: anorexia nervosa; AAN: atypical anorexia nervosa; BMI: body mass index; M: Mean; NA: not available on hospital records; S.D: standard deviation*

2.2 Adapting the EDE-Q and CIA

Patients and staff were sought for feedback on the EDE-Q and CIA between October 2022 to January 2023. The ward operates a 24-hour shift pattern, so three communication methods were used to maximize responses. First, staff could complete physical questionnaire copies, noting any unsuitable questions or wording with space for qualitative feedback.

Second, an on-site Clinical Psychologist conducted two focus groups for verbal feedback. Third, individual meetings with staff or patients were held in person or virtually. In total, 24 respondents provided feedback, comprising 11 professionals and 13 patients, summarised in Appendix H.

Feedback indicated the EDE-Q and CIA were too lengthy and contained items irrelevant to inpatient care. To enhance relevance and reduce length, items were reworded where suitable or deleted if unamenable to modification, resulting in inpatient-specific versions (CIA-I; EDE-I) for routine care. Revisions were made based on feedback from staff, service users, and clinical knowledge from the on-site Clinical Psychologist. Draft adaptations were reviewed by experts by experience, including two former patients and one current patient of Cotswold House.

For the EDE-I, six items were reworded from the original EDE-Q (items 10, 16, 18, 24, 27, 28) to make applicable to inpatient conditions, and ten items deleted due to being inapplicable and unable to correct through rewording (items 1, 2, 3, 4, 9 ,13, 14, 15, 17, 19). For the CIA-I, six items from the CIA were deleted due to being inapplicable and unable to correct through rewording (items 3, 4, 7, 10, 12, 15). The measured timescale of the EDE-Q and CIA was revised from “Over the last 28 days…” to “Over the last 7 days…”, and a short space for written elaborations to items were added to each page. Each of these changes, with a more detailed accompanying rationale, are detailed in Appendix I. The final EDE-I and CIA-I are presented in Appendix J and K respectively.

2.3. Trialling the Adapted Measures

The following implementation plan was developed with input from staff, patients and expert by experience data gained prior to the piloting of measures.

Patients completed a six-week trial period using the EDE-I and CIA-I. They were provided each measure weekly, and given the option to complete measures less frequently if they deemed appropriate. Although biweekly measurement is recommended in intensive settings (Austin et al., 2023), optional weekly measurement allowed patients to potentially gain a richer experience of the measures during their trial period. Measurements were provided and completed via two main strategies. First, paper copies of measures were available on the ward, with patients encouraged to complete them in their own time. A nominated staff member at Cotswold House oversaw the distribution and collection of measures. Second, patients were presented with the measures weekly during routine ward-based meetings by a nominated staff member at Cotswold House, and invited to return measures by the end of the day.

Shortly after the six-week trial periods (usually within 1-3 weeks), patients completed a semi-structured interview, held remotely or in-person either by author SH or LH. Interviews sought views on their experience of the adapted measures and suggestions for further refinement. The full interview schedule (presented in Appendix L) was developed by the authors using expert by experience consultation on draft schedules. The following questions were asked:

- Can you describe the ways in which your eating disorder and mental health was monitored over the last six weeks?
- How was this different to the ways your eating disorder and mental health was monitored before the last six weeks?
- Do you feel that the measures used to monitor your mental health over the last six weeks captured the difficulties you were facing as an inpatient and what was most meaningful for you?

- Do you feel that the measures used here are more appropriate at capturing your experience as an inpatient than measures used previously?
- Are there any changes that could be made to the measures used that you think could make them more suitable to inpatient experience?
- Are there things relevant to your stay at Cotswold House, such as your eating disorder, daily needs or other important areas, do you feel are not asked about that should be asked about?
- Is there anything that I have not asked today that you would like to discuss?

Recommendations were provided to Cotswold House, consisting of the adapted measures, patient feedback and verbal presentation to a subset of the staff team (see Appendix M for service's feedback).

2.4. Data Analysis

Interview transcripts were analysed using the Framework Method (Gale et al., 2013) to identify themes, selected due to expected homogeny of data and resultant utility for collating themes across interviewees. Initial coding labels for three transcripts were coded independently by three members of the research team, (SH, AJ, AL-Z). From this, a set of commonly identified coding labels were generated. This formed an initial analytical framework which was applied to all subsequent transcripts. The research team met again to group codes that were conceptually related. For example, four codes: "Relevance to inpatient services"; "Distribution by the service"; "Benefit to service and patients"; "Appropriateness of timescale", were grouped to generate an initial theme of "Purpose". Five initial themes were identified: purpose; power and autonomy; emotions; energy and motivation; improvements, which formed another working analytical framework. Then, all transcripts were revisited and analytic memos produced, providing a narrative of each theme and the

patterns of information they covered. Verbatim quotes from each patient denoting data relevant to each theme were tabulated; an anonymised representation is presented in Appendix N. The research team met together, reviewed all materials, and agreed the final themes.

3. Results

Two of the initial themes were merged due to homogeneity, resulting in four final themes, denoted as (1) purpose; (2) motivation and engagement; (3) emotional impact; (4) agency, autonomy and power.

Theme 1: Purpose

The importance of measures aligning with the overarching purpose of inpatient care was regularly highlighted. It was important to patients that measures only captured behaviours possible under inpatient restrictions. Many reflected how the original measures contained numerous inapplicable questions: one described completing the original measures thinking *"that doesn't apply, that doesn't apply"* (P1). In contrast, patients felt the EDE-I and CIA-I contained only relevant items *"I feel like it answers pretty much everything"* (P6) and did not miss important details; *"I mean, not that anything really is missing. It covers a good range."* (P4).

Patients felt the new measures overcome barriers presented by the original measures in gaining accurate and meaningful answers. Most regularly praised was the change in timeframe, from 'Over the last 28 days' to '7 days'. This made it easier for patients to answer the questions *"It was easier to fill it out, because I could remember what I had done"* (P3), which was named as especially important, as EDs often engender cognitive difficulties "*People with eating disorders do have problems with cognitive function…like, I can't remember what I did over the last 28 days"* (P3). It also felt more appropriate due to the fast-

changing nature of inpatient settings *"In a setting like this, it's hard to remember a week, let alone a month"* (P2); "*A month is too much, because of how things much things change"* (P3). Together, this allowed patients to answer more accurately *"you think about each day: "what have I done?", so it is easier"* (P4) and honestly *"So the data you get is…more valuable than probably falsified data from a month"* (P2). Other barriers overcome were the reduction in number of items on the measures, making completion less labour-intensive *"I just like that it's not bulky, it's straight to the point" (P2),* facilitating weekly measurement *"It shows how we are doing on a week to week basis"* (P1), *"Collected more often, seeing progression. They can show areas you are challenging less"* (P3) by increasing patients' willingness to complete them *"This one…would make it much more likely I think to be filled in"* (P5).

These changes fostered a sense that the measures were being conducted for the purpose of tracking progress and voicing difficulties, rather than service-related needs: *"These ones are actually meaningful, and it doesn't' feel like just another tick box exercise that we're asked to do probably for the CQC or, someone like that"* (P5).

Although the new measures felt more fit for purpose than the original EDE-Q and CIA, it was felt further development could enhance this further. Five patients referred to the reduced applicability of the adapted versions as patients increased their access to community and home leave. *"Because in the unit there is limited access to things, but when you're on leave it is just you"* (P3); *"going on home leave, they have that scope of freedom"* (P2). Patients suggested an additional section for those with community access *"I feel there needs to be a separate bit for home leave"* (P2), space for patients to contextualise their answers *"there could be a section that if you have engaged in it, you could say where"* (P3); *"you could add a part to some of the questions, like, "don't include times on home leave", or "whilst you are on the ward",* (P4) although it was not felt that a separate questionnaire

would be appropriate or feasible *"you can't possibly create a million different questionnaires for, you know whether you've got home leave for half a week or two days or whatever"* (P7).

Theme 2: Motivation and engagement

Regular reference was made to how aspects of the measures impacted patients' motivation and engagement, both with the measurement process itself and wider treatment. Due to the features presented in the 'purpose' theme, the original measures fostered dejection, *"It feels like, uhh, a pointless exercise, a box ticking exercise"* (P5), low motivation *"After doing so many… the old ones, and feeling dead inside, as you just tick any odd random box"* (P7), and frustration *"It was frustrating to be asked that when it just felt it, like it wasn't tailored to where we were"* (P7), reducing the engagement and accuracy of answers. The new measures appeared to reduce these feelings in the following ways.

Firstly, the original measures fostered a sense the measures were collected for service-based needs rather than to understand patients' experiences *"is there any progress here rather than just filling it in for somebody else?"* (P7) reducing the engagement and accuracy of answers *"oh I'll just circle this, or try and make it apply to the unit",* (P2). Instead, the new measures felt more for the benefit of patients' own goals *"it can be tied into treatment goals…so there's a bit more motivation and incentive to fill it in"* (P7); *"It sort of, gives me a sense of… of where I'm going"* (P5) and reflective of their experiences *"actually feels like its related to something you're experiencing"* (P5). The removal of irrelevant questions was highly praised, *"rewording to make them more suitable feels better"* (P4); driving clarity and purpose in completing the measures *"Quite clear and quite easy to fill out, and I feel like it answers pretty much everything"* (P6), increasing motivation and engagement *"so there's a bit more motivation and incentive to fill it in"* (P7). They felt the new measures would benefit staffs' ability to support patients *"it can get staff to know where that patient is at"* (P6) and

patients' ability to self-monitor *"These can be of benefit to you and be able to track your own progress"* (P9).

Secondly, Cotswold House allowed patients to choose the frequency they complete measures, or decline entirely. This was regularly implicated in increasing motivation and agency, *"I was able to just do it in my own time. There was not pressure to do it"* (P8), which was particularly helpful as ED symptomology may make completing questionnaires more difficult *"when you're still suffering the effects of malnutrition to be given a load of papers…you don't need it"* (P5); *"You might give it to someone at a time it is the last thing they want to be thinking about, whereas other days it is like sure here you go, done"* (P4). However, one patient highlighted feeling compelled to answer questions despite the optional nature being emphasised *"Feeling like you ought to…I want to let people know how I'm feeling. But I don't want to go against me"* (P8) and another feeling worried that their scores may impact how they are viewed by others *"I don't want to tick that in case they think that I don't deserve the bed or I'm in the wrong place"* (P7). This patient stated they *"don't think it would"* make them not complete measures, just that it would instil worry about how the data are used.

Theme 3: Emotional Impact

Completing the measures evoked varied emotions, with emotions at the time impacting patients' ability to respond effectively. The revised timescale, 'Over the last 7 days,' reduced distress by minimizing focus on cumulative negative experiences: *"There isn't a lot of dwelling on the past…and people don't want to live in the past"* (P8). It was also easier to recall *"it's easier to remember what happened in those last seven days than what happened over a whole month"* (P2), and invited positive reflections: *"you might think actually I have got better because I am not thinking about my body seven days a week"* (P9). The inclusion of text boxes and removal of irrelevant items reduced stigma by feeling less generic: *"I think*

it's getting away from the stereotypical idea of the anorexia" (P7). It also felt more contextualised to inpatient services *"[the new measures have] the understanding that people are already starting recovery"* (P3) leading to a sense of feeling understood *"I thought that that was- that's perfect. That's the sort of question you need to ask people who are undergoing inpatient treatment"* (P5).

Secondly, patients highlighted that the EDE-I increased positive affect, through feeling heard and understood *"the seven-day questionnaire is much better all-around that, really feels like you're understood"* (P6), that it was useful: *"I felt that they might help my situation"* (P8), allowed patients to self-monitor: *"It shows how we are doing on a week to week basis"* (P1), and track change *"it's helpful. To get that time, that checking of the same questions"* (P8).

Patients frequently noted that their emotional state when completing measures affected their ability to respond accurately, reducing validity: *"I haven't got the emotional spoons… feeling dead inside, as you just tick any odd random box"* (P5). Patients therefore appreciated the choice to decline when overwhelmed: *"You might give it to someone at a time it is the last thing they want to be thinking about, whereas other days it is like sure here you go, done. So if it is flexible I don't see any issues"* (P4). Additionally, the measures had a reduced cognitive burden compared to the originals: *"I don't need to dig through the past answering them"* (P8) and patients felt more comfortable in providing honest answers: *"I think it's a really common theme that people think they're not sick enough to be there and then they don't deserve the bed… it's like, oh, maybe I should be making it so that I'm a bit worse"* (P7). The text boxes were praised for allowing elaboration: *"It is good…just to explain in more detail"* (P2), helping patients feel heard and understood. We noted that three patients (P1, P2, P9) were underrepresented in this theme, electing to predominantly discuss practical changes of the new measures over their emotional impact.

Theme 4: Agency, autonomy and power

The new measures appeared to provide a sense of ownership and agency to patients compared to the original measures. As is typical of inpatient services, patients are aware of power differentials between themselves and the service *"it's taken out of your hands when you're in an inpatient unit"* (P6), and a felt loss of agency due to meeting progress outcomes *"We're pretty much forced to eat in here"* (P5). These power differentials did not appear to be a major theme of the data alone; patients generally felt supported and empowered at the service. However, constructs related to power and autonomy appeared to intersect with the measurement process.

Patients felt empowered by the rationale of the measurement process being made clear by staff *"the most important thing…why I was doing the questionnaires to start with"* (P7), feeling agency would be lost if this is unclear *"Instead of, what am I doing this for? What's am I doing it for me? Or am I doing it for you?"* (P7), especially as the original measure felt mismatched to an inpatient service *"So, I'm doing it, but I don't know what it's trying to capture"* (P9).

One patient felt this made the measures feel they had ulterior motives to trick patients out *"You're being asked trick questions…the same thing in different ways…how do I answer that!"* (P6). Another felt the irrelevant items could make them feel undeserving of their inpatient treatment *"I didn't exercise in a driven or compulsive way…Maybe I'm not sick enough to be here"* (P7) potentially encouraging them to present as more unwell to be more deserving *"Oh, I'm not exercising here. Maybe I should be exercising"* (P7). Conversely, this patient praised the new measure for overcoming this, *"I don't feel any of the questions make me uncomfortable"* (P7). Others described the new measures as *"Quite clear and quite easy to fill out"* (P6), agreeing they did not generate anxieties when completing them *"they were*

not triggering, and I wasn't overthinking things, and I felt that they might help my situation" (P8).

4. Discussion

The EDE-Q and CIA were identified by patients at Cotswold House as containing questions inapplicable to an inpatient context, being unsuitably lengthy, and the 28-day measurement timescale being unsuitably long. These appeared to compromise the utility and acceptability of these measures in an inpatient context and indicated need for adaptation. When delivered to a subset of inpatient ED patients, adapted versions of the EDE-Q and CIA tailored to an inpatient context were perceived as more purposeful, allowed patients to provide more accurate data, reduced negative emotions, increased positive emotion, and increased engagement compared to their original counterparts.

The adaptations involved reducing the number of items by removal of wholly irrelevant items, rewording partially irrelevant items, providing space for qualitative elaboration on answers, and a change in the measured timescale from 28 days to 7 days. Each of these changes were supported by patients as increasing relevance to inpatient environments.

Patients highlighted several improvements in the new measures, particularly in terms of their alignment with the purpose and needs of inpatient care. The shift from monthly to weekly measurements was widely praised for its ability to accommodate the dynamic nature of inpatient environments and the cognitive impairments associated with EDs. The new measures made patients feel less stigmatised and more actively involved in their care. Patients appreciated the shorter timescale, which made it easier to recall experiences and track progress over time.

4.1. Study Limitations and Further Improvements

Many patients noted the adapted measures are less applicable for inpatients with extended community and home leave access. This concern featured especially when patients were discussing the CIA-I, rather than the EDE-I. The removed CIA items were due to being inapplicable under ward-based restrictions, yet these become relevant again when patients gain unsupervised leave access. This concern also applied to the adapted EDE-Q when discussing the removal of items 13, 14, 15, 17 and 19. As such, it must be considered whether it is feasible for these EDE-Q items, and CIA questions 3, 4, 7, 10, 12 and 15, to remain included, with respondents completing only if they have unsupervised leave access.

A further limitation of this study in developing inpatient adaptations of the EDE-Q and CIA is its use of one service within one twelve-month period. Further research exploring these measures in other services is indicated to increase robustness. It is unclear in what ways the psychometric properties of the original measures, or consistency with the underpinning theoretical basis, are compromised in our adapted versions. Further refinements using a wider sample of inpatient services should be conducted, following which psychometric properties should be established, especially internal consistency and construct validity compared to the original measures. In absence of this, it is inadvisable for clinicians to employ our versions of the EDE-I and CIA-I for formal research (beyond audits and service evaluations), and use should be limited to idiographic clinical monitoring.

The project also sought to employ an adapted version of the EDE-Q and CIA for admission and discharge, wherein none of the items were adjusted but the timeframe was changed from ‘Over the last 28 days’ to ‘7 days’. This was intended to provide potential alternative measures at these key points in patient’s treatment, as indicated by the qualitative data gained from staff and service users. However, due to service requirements to implement the original measures at admission and discharge, these were not trialled. This would likely

present a barrier to further research efforts to experiment adjusting the timescale of the EDE-Q and CIA at these stages, wherein collection of measures consistent with previous and future services patients will encounter are imperative. Our findings indicate that patients found the reduced timescale of considerable benefit: investigation of how only the timescale change affects the psychometric properties of the measures would inform the feasibility of this measure being implemented clinically.

4.2. Conclusions

The use of the EDE-I and CIA-I for routine clinical monitoring at Cotswold House (and possibly other inpatient settings) would likely be a more valid way of measuring psychopathology and progress, increase completion rates, gain more person-centred answers, reduce the emotional burden of the measurement process on patients and increase their felt sense of agency and collaboration with the service. There is scope to audit this further to assess applicability of the measures in other inpatient ED wards, and additionally to establish the psychometric properties of these measures.

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Theoretically Driven Research Project

Health anxiety, mental defeat and fear of illness recurrence and progression following a cardiac event: Implications for cardiac rehabilitation

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Please note: The data collection for this research is ongoing beyond the submission of this thesis. As such, a subsequent publication arising from this study may differ in sample size, analytic approach, and/or findings to those reported here.

Internal Supervisor: Professor Paul Salkovskis

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Word count: 5015 (4815 + 2 tables counted as 100 words each)

Target Journal: British Journal of Health Psychology. This journal publishes research on psychological factors in health-related behaviours and recovery outcomes, making it relevant to this work examining transdiagnostic processes in cardiac rehabilitation. Guidance for authors available in Appendix O.

Declaration of competing interest: None.

Abstract

Objectives: To evaluate the contribution of health anxiety, mental defeat and fear of recurrence and progression (FRP) as variables in the adjustment process following cardiac events and subsequent wellbeing, adjustment and rehabilitation.

Design: A two-part study was conducted; cross-sectionally examining psychological factors shortly following a cardiac event, and longitudinally examining how these variables were associated with adherence and physical/psychological outcomes of cardiac rehabilitation.

Methods: A UK-based sample of post-cardiac event patients (N=176, M_{age}=66.1, SD=10.0) were categorised as high health anxiety with depression and/or anxiety, depression or anxiety only, or neither health anxiety nor depression/anxiety. Mental defeat and FRP were compared across groups pre-rehabilitation, and examined in relation to adherence and outcomes of an 8-session cardiac rehabilitation program.

Results: Analyses indicated significantly higher mental defeat and FRP in those with health anxiety than other groups. However, regression analyses showed neither health anxiety, mental defeat nor FRP were significantly associated with rehabilitation adherence or outcomes.

Conclusions: This study identified mental defeat and FRP as important factors in health anxious cardiac patients, with implications for the coping and adjustment process and rehabilitative efforts. No linear association between these variables and rehabilitation adherence and outcomes were found, suggesting more nuanced approaches to identifying their impact on rehabilitation may require development.

1. Introduction

1.1. Psychological burden of cardiac events

Experiencing a cardiac event, defined as events such as a myocardial infarction, cardiac arrest, or other acute coronary syndrome (Lerman & Zeiher, 2005), imposes significant physical and psychological challenges. As survival rates of these events have increased due to healthcare innovations, so too has the need to understand the impairments and disabilities faced by survivors. Whilst the medical outcomes are well documented, the psychological profile of patients remains significantly under-researched. This is despite the fact cardiac events are, by nature, significant adverse experiences, typically resulting in lasting changes to sense of self, health, and future (Randall et al., 2009; Murphy et al., 2023).

Rates of depression and anxiety are elevated in post-event patients than the general medical outpatients, although reported rates vary widely, from 10 to 52% (Bunch et al., 2004; Schaaf et al., 2013). Adverse psychological impact is typically greatest during hospitalisation immediately following the event, may persist in the absence of appropriate support, though is amenable to improvement when such support is provided (Larsson et al., 2014).

Post-traumatic stress symptoms are also common, with prevalence 2.5-3 times higher in cardiac event survivors compared to other cardiovascular conditions (Agarwal et al., 2019). These symptoms, especially avoidance, psychosocial numbing, hyperarousal and perceptions of recovery (Presciutti et al., 2019) can be persistent, with 31% of survivors meeting clinical thresholds for PTSD six months post-event (Presciutti et al., 2018).

Health-related anxiety is also prevalent in cardiac populations and important in cardiovascular prognosis (Hohls et al., 2020; Berge et al., 2016). ‘Health anxiety’, or ‘hypochondriasis’, is defined by the International Classification of Diseases—ICD-11 (6B23; World Health Organisation, 2022) as a preoccupation and/or fear of experiencing a serious or

life-threatening illness. In the context of cardiac health, it is described under numerous terms including cardiac anxiety (Rosman et al., 2015), heart-focused anxiety (Eifert et al., 2000) and cardiophobia (Eifert, 1992). Across definitions, these anxieties may interfere with health-restoring behaviours such as exercise, medication adherence and dietary regulation (Bauer et al., 2012). They also often interfere with other aspects of health-related quality of life (Smith et al., 2015), including sleep, stress management and daily functioning (Wachelder et al., 2009). Health-related anxieties present an immediate concern in this population, as poor adherence to treatment and health behaviours are prospectively associated with further cardiac events and all-cause mortality (Chowdhury et al., 2013).

1.2. Cardiac rehabilitation and treatment adherence

Cardiac rehabilitation is an essential component of management following cardiac events. In the UK, structured cardiac rehabilitation programmes within National Health Service (NHS) trusts are endorsed by National Institute of Health and Care Excellence (NICE) quality standards and guidelines (NICE, 2013, 2015) and the NHS long-term plan (NHS Digital, 2024). Programmes follow standards set by the British Association for Cardiovascular Prevention and Rehabilitation (BACPR, 2023), which include exercise training, education and psychological support. Programmes ideally commence within two weeks of a patient's hospital discharge (BACPR, 2023), and typically span 6 to 12 weeks (Buckley et al., 2013).

Adherence to all components of rehabilitation can be challenging, and influenced by numerous physical and psychological barriers (Bitton et al., 2013). Demographic inequalities also appear prominent, with lower participation and completion rates associated with younger age, minoritised ethnic group status (Zhang et al., 2017), current smoking, low socioeconomic status (Turk-Adawi et al., 2014), obesity (Biswas et al., 2018), low health literacy, comorbid physical health conditions (Gaalema et al., 2017) and longer delay

between hospital discharge and beginning rehabilitation (Ruano-Ravina et al., 2016). Physical barriers include access to financial resources, transportation, medication, and geographical proximity to healthcare services (Erskine et al., 2018).

Contrastingly, psychological barriers are comparatively under-researched. Depressive symptoms, health-related anxiety and maladaptive health behaviours negatively influence healthcare utilization (Hohls et al., 2020), quality of life and cardiovascular prognosis (Tully et al., 2016; Nakamura et al., 2013). Outcomes improve when depression and anxiety are treated (Rutledge et al., 2013). These associations are reflected by the requirement for routine assessment of depression and anxiety symptoms in cardiac rehabilitation (BACPR, 2023; NICE, 2015).

1.3. Mechanisms linking cardiac recovery and psychological factors

Transient periods of health anxiety are common, and to an extent expected, following serious health events (Lebel et al., 2020). For some, this develops into more sustained anxiety, resulting in prolonged distress and functional impairment (Bauer et al., 2012). Health anxiety has been linked to reduced treatment adherence across a range of physical health conditions (Rode et al., 2006; Tang et al., 2007; 2009), is overrepresented in cardiac patients (Berge et al., 2016) and is associated with increased risk of recurrent cardiac events and poor prognosis (Tully et al., 2016).

As such, examining the nature and trajectory of health anxiety in patients recovering from recent cardiac events is essential to mitigating disease burden. To our knowledge, no research has examined the incidence or course of health anxiety specifically in patients following a cardiac event. This is despite cardiovascular disease and its associated risk factors being among the physical health conditions most strongly linked to health anxiety, akin to cancer and diabetes (Norbye et al., 2022). This population is of particular interest considering

cardiovascular rehabilitation is routinely commenced shortly after patients' index events (BACPR, 2023; Gaalema et al., 2017), wherein transient health anxiety may be more pronounced.

The cognitive-behavioural model of health anxiety (Salkovskis et al., 2003) offers a useful framework for examining these processes. It proposes individuals' reactions to health-related information are shaped by pre-existing beliefs about health and illness. "Maladaptive" assumptions about health can lead to catastrophic interpretations of bodily symptoms or medical advice, reinforcing anxiety and unhelpful coping behaviours.

Alongside this, understanding how symptomology affects prognosis is equally important. Without this, these associations may appear counterintuitive, as health-related vigilance, checking behaviours and avoidance behaviours may be feasibly considered to be health-protective. The proposed model (Salkovskis et al., 2003) instead argues that when these behaviours are driven by psychological distress, these may (1) provide no additional benefit to patient's health than routine medical care; (2) inadvertently worsen quality of life through restriction of meaningful activity. Although physiological variables such as chronic stress, allostatic load, oxidative stress, autonomic dysregulation and immune dysfunction have been identified as a potential biological mechanism linking anxiety and poorer health (Felix et al., 2023; Costa et al., 2022), it is important to consider behavioural mechanisms, given their relevance to rehabilitation adherence and day-to-day functioning.

In medical contexts, the health anxiety model may benefit from integrating related psychological constructs to better capture the complexity of health-related distress (Salkovskis et al., 2016). Accordingly, we propose two constructs may be especially relevant to consider for post-event patients when considering implications for cardiac rehabilitation. These are: (1) mental defeat; (2) fear of illness recurrence and progression (FRP). Both

constructs have been linked to poorer treatment engagement and clinical outcomes in other physical health populations, and improve when addressed in psychological interventions (Murata et al., 2019; Tauber et al., 2019; Tang et al., 2010).

1.4. Mental defeat

Mental defeat is a psychological state wherein one's circumstances lead to persistent feelings of powerlessness, loss of agency, demoralisation, and being overwhelmed (e.g. Tang et al., 2007). It is thought to emerge when past experiences, particularly those involving perceived failure or helplessness, are activated by current adverse or life-altering circumstances (Ehlers et al., 1998). Mental defeat can be understood as a form of catastrophising regarding social and role functioning, sense of identity and social status in response to significant changes, which may include acute or chronic physical illness. Anecdotally, a cardiac patient may exhibit mental defeat through catastrophising thoughts such as: *'These symptoms mean I am useless to my family and friends'*, or '*I'll never be the person I once was"*. These thoughts can reinforce cycles of negative thinking, hopelessness and self-criticism which may reduce motivation to engage in rehabilitation.

By inhibiting productive action and goal-directed behaviour, mental defeat has been proposed as a mechanism underlying poor treatment response in the context of both traumatic events (Ehlers et al., 1998) and depression (Gilbert & Allan, 1998). This suggests potential relevance for cardiac event patients, whose recovery typically involves adapting to sudden, life-altering circumstances.

1.5. Fear of Illness Recurrence and Progression

By contrast to mental defeat, fear of illness recurrence focuses exclusively on future-oriented concerns about the return of illness, while fear of illness progression involves concerns that the condition will worsen in severity or impact (e.g. Bergerot et al., 2022). These concepts

were primarily developed within oncology (Crist & Grunfeld, 2013), but more recently regarded as important across a range of physical conditions (Sharpe et al., 2024). Due to their conceptual similarities, recent work has proposed a unified framework encapsulating fear of illness recurrence and progression (FRP; Coutts-Bain et al., 2022; Sharpe et al., 2023).

FRP represents a specific type of health anxiety relevant to those living with or recovering from serious physical illness. It involves overestimation of the likelihood of event recurrence and progression, which motivates health anxiety-related safety-seeking behaviours such as excessive symptom monitoring, catastrophising, avoidance and rumination (Salkovskis et al., 2003). Emerging evidence suggests FRP is highly prevalent among cardiac patients and associated significantly with cardiac anxiety (Sharpe et al., 2024; Clarke et al., 2024). Severity of recurrence fears appear greater shortly after onset of a health event (Fait et al., 2018) and associated with negative coping styles in cardiac patients (Zhen et al., 2022), suggesting high relevance to the context of post-cardiac event patients.

1.6. The present study

Within a cognitive-behavioural health anxiety framework, FRP may interact with mental defeat through shared catastrophising beliefs about illness worsening, and impact of the illness on identity, status and social roles. This may offer a mechanistic explanation predicting poorer adherence to medical treatments and lifestyle modifications among cardiac patient with elevated health anxiety (Berge et al., 2016; Petricone-Westwood et al., 2019).

Taken together, health anxiety, mental defeat and FRP could account for variance in both physical and psychological outcomes following a cardiac event. The present study seeks to evaluate this in the context of cardiac rehabilitation. Post-event patients will be divided into those with high levels of psychological distress (either with or without clinically elevated health anxiety) and those without evident psychological distress.

The primary hypothesis is that cardiac patients with elevated health anxiety and anxiety or depression, will report significantly higher scores on measures of both mental defeat and FRP relative to patients with depression and/or anxiety alone, and patients without depression or anxiety. The secondary hypothesis is that health anxiety, mental defeat and FRP will each be uniquely associated to (a) poorer completion rates of cardiac rehabilitation and (b) poorer psychological and physical improvements following rehabilitation.

2. Method

Ethical approval for this study was obtained following a favourable opinion from the Tyne and Wear South Research Ethics Committee (24/NE/0041). The study was sponsored by University of Oxford Research Governance, Ethics & Assurance (RGEA, PID17286-SI001) and approved via the Integrated Research Application System (IRAS ID 331618).

2.1. Participants and sampling procedure

The study involved three groups, comprising people who experienced a recent cardiac event with: (1) health anxiety and at least one of anxiety or depression; (2) at least one of depression or anxiety, and not health anxiety; (3) none of depression, anxiety or health anxiety. Eligibility criteria were (1) age 18+, (2) competency in English, (3) recent experience of a cardiac event resulting in eligibility for cardiac rehabilitation at the research site, with no exclusion criteria. The nature of the cardiac event was not a criterion for inclusion, and participants may have experienced a range of events (e.g., myocardial infarction, arrhythmia, cardiac surgery).

Potential participants were recruited from an NHS hospital containing a cardiac rehabilitation team in Oxford, England. They were invited to participate by hospital staff

during in-person assessments, provided routinely to patients following their cardiac event prior to rehabilitation.

2.2. Study design

Data were collected from two time points: (1) shortly after their cardiac event, before starting cardiac rehabilitation; (2) following completion of an 8-session cardiac rehabilitation program.

There were two components to the study: (1) a cross-sectional between-subjects design at time point one; (2) a prospective cohort regression design at both time points. The cross-sectional aspect focused on main differences between participants' responses on measures of psychological variables at the point of contact by health professionals following a cardiac event. The regression aspect focused on differences between participants' responses on measures of psychological variables to cardiac rehabilitation outcomes.

2.3. Measures

- The **clinical demographics** collected included participant' age, gender, ethnic, marital status, pre-rehabilitation smoking status, BMI and days between hospital admission and contact with the rehabilitation team.
- The **Hospital Anxiety and Depression Scale (HADS)** is a 14-item assessment of anxiety and depression symptoms in hospital settings, using 1-4 Likert-scales with higher scores indicating greater severity. The scale shows strong reliability for depression (α=.93) and anxiety (α=.90), (Norton et al., 2013) and good convergent and concurrent validity (Bjelland et al., 2002). In the current sample, internal consistency was excellent for the anxiety (α=.88) and depression (α=.88) subscales.
- The **Short Health Anxiety Inventory (SHAI)** is a 14-item measure of health anxiety symptoms using 1-4 Likert-scale questions, with higher scores indicating greater

health anxiety. It shows convergent, discriminant and criterion-related validity (Salkovskis et al., 2002) and strong internal consistency (α=.85-.94; Alberts et al., 2013). Internal consistency in this sample was α=.90.

- The **Mental Defeat Self Perception Questionnaire (MDSP)** is a 20-item measure of mental defeat which uses Likert-scales ranging 1-5, with higher scores indicating greater mental defeat. Psychometric validation is limited, but construct validity and internal consistency can be inferred through empirical studies using it alongside other relevant measures (e.g. Murata et al., 2019; Nagata et al., 2018). In the present study, internal consistency was α=.96.
- **The Worry about Recurrence or Progression Scale (WARPS)** is an 18-item measure of FRP, using 1-5 Likert-scales ranging from "strongly disagree" to "strongly agree", with higher scores indicating greater FRP. The WARPS shows good construct validity, excellent internal consistency (α=.96) and test-retest reliability (Sharpe et al., 2024). In the current sample, internal consistency was α=.96.
- Physical fitness was measured using a **Metabolic Equivalent Level (MET)**, which measures 'fitness' level using maximal output from a bike test, completed at the first and last rehabilitation sessions.
- The **Dartmouth Quality of Life Index (DQOL)** is a 9-item measure of health-related quality of life using 1-5 Likert-scales, with higher scores indicating lower quality of life. The scale has evidenced discriminant and convergent validity (Gherunpong et al., 2004). In the current sample, internal consistency was good (α=.85).

2.4. Procedure

Those who opted in were emailed a link to an online questionnaire, which contained an information sheet, psychometric measures (SHAI, MDSP, WARPS) and consent form for

researchers to access their hospital data after they complete rehabilitation. Using pseudonymised codes, the routinely collected pre-rehabilitation data (HADS, DQOL and baseline clinical demographics) were matched to participants' online questionnaire data.

Participants were provided an eight-session cardiac rehabilitation program compliant with BACPR (2023) standards. At the first session, MET was recorded to measure baseline fitness. This was repeated at the final session, followed by measuring HADS, DQOL and BMI. Whether participants completed their program or self-discharged early, was also recorded.

2.5. Data analysis

2.5.1. Data Processing

As most participants either completed rehabilitation or declined to start, the distribution of completion rates (mostly 0% and 100%, with few midpoints) was non-normal, bimodal and heteroscedastic, violating core assumptions of linear regression (Tripepi et al., 2008). Program adherence was therefore conceptualised as a categorical variable. Participants who declined rehabilitation or did not complete after starting were categorised as "non-adherent", and those who completed rehabilitation categorised as "adherent". Participants who were not offered rehabilitation (typically due to being medically unfit, out-of-area or having another health event) were not included in adherence analysis.

2.5.2. Statistical analysis

To test the primary hypothesis, dependent variables (MDSQ, WARPS) were compared between groups using analysis of variance (ANOVA). Participants who scored above threshold for health anxiety (SHAI≥14) but below threshold for depression and anxiety (HADS-A<11; HADS-D<11) were excluded from group comparisons to ensure clear diagnostic categorisation. Where ANOVA indicated a significant main effect of group, post

hoc comparisons were conducted using Tukey's HSD when equal variances were assumed, and Dunnett's T3 when not assumed. Equality of variances was assessed using Levene's test.

To test secondary hypothesis (a), whether health anxiety, mental defeat and FRP predicted treatment adherence, a binary logistic regression was conducted with rehabilitation completion (adherent vs. non-adherent) as the binary outcome variable. Age, sex, days between hospital admission and commencing rehabilitation, and baseline depression and anxiety were considered as potential covariates but not included in the final model as none were significantly associated with adherence.

To test secondary hypothesis (b), whether health anxiety, mental defeat, and FRP predicted treatment outcomes, multiple linear regressions examined whether health anxiety, mental defeat, and FRP uniquely predicted change in each outcome. To reduce the risk of Type I error and maintain statistical power, only one psychological outcome (quality of life) and physiological outcome (fitness level) were selected for regression analysis. Quality of life was selected over other candidates (anxiety and depression) as it offers a comprehensive indication of psychological and functional adjustment; fitness level was chosen (over change in BMI), as higher scores provide an unambiguous indicator of improvement, independent of premorbid weight. To account for baseline differences, both regressions were repeated using residual change scores (post-rehabilitation scores regressed on pre-rehabilitation scores for DQOL and MET).

3. Results[1]

3.1. Participants

A total of 178 patients completed the online forms; two were excluded due to recorded mortality, providing a final sample of 176 (Appendix P). The sample comprised 130 males (73.9%) and 46 females (26.1%), aged 37.2 to 90.1 years (M=66.1, SD=10.0). The time between participants' cardiac event and initial contact from the cardiac rehabilitation team ranged 6 to 159 days (M=48.2, SD=24.7).

Regarding smoking status, 28 (15.9%) identified as current smokers;148 (84.1%) were non-smokers. For marital status, 136 (77.3%) were married, 11 (6.3%) partnered, five (2.8%) separated, nine (5.1%) widowed, and 15 (8.5%) single. For occupational status, 73 (41.5%) were retired, 51 (29.0%) employed full-time, 27 (15.3%) employed part-time, four (2.3%) unemployed, and one (0.6%) student. For ethnicity, 130 (73.9%) identified as White British, 20 (11.4%) as White Other, 13 (7.4%) as Asian Other, five (2.8%) as Asian Mixed, and four (2.3%) as Black African. Ethnicity was not stated by four participants (2.3%).

3.2. Primary hypothesis

In testing the primary hypothesis, 17 participants were excluded due to scoring above threshold for health anxiety and not depression or anxiety, providing a main sample of 159. This comprised 54 in the "health anxiety and depression/anxiety" (HA+AD) group, 29 in the "depression/anxiety only" (AD-only) group, and 76 in the "non-clinical" group. Sample demographics are presented in Table 8.

[1] The data collection for this research project is ongoing beyond the submission of this thesis. As such, a subsequent publication arising from this study may differ in sample size, analytic approach, and/or findings to those reported here.

Table 8

Main sample demographics.

Measure	HA+AD group (n=54)	AD-only group (n=29)	Non-clinical group (n=76)	Between-groups comparative statistics
Gender: n(%)				
Female	22 (40.7)	9 (31.0)	11 (14.5)	**$\chi^2_{(2, N=159)}$=11.60, p=.003*; Cramer's V=.27**
Male	32 (59.3)	20 (69.0)	65 (85.5)	
Ethnicity: n(%)				
White British	37 (71.2)	21 (72.4)	60 (80.0)	$\chi^2_{(2, N=156)}$=1.51, p=.471; Cramer's V=.10
White Other	7 (13.5)	4 (13.8)	7 (9.3)	
Asian (Mixed or Other)	7 (13.5)	4 (13.8)	1 (1.3)	
Black African	0 (0.0)	0 (0.0)	3 (4.0)	
Other Mixed	1 (1.9)	0 (0.0)	4 (5.3)	
Employment status: n(%)				
Retired	22 (40.7)	10 (34.5)	31 (40.8)	$\chi^2_{(4, N=159)}$=2.46, p=.652; Cramer's V=.09
Full-time employed	15 (27.8)	12 (41.4)	21 (27.6)	
Part-time employed	17 (31.5)	6 (20.7)	21 (27.6)	
Unemployed	0 (0.0)	1 (3.4)	2 (2.6)	
Student	0 (0.0)	0 (0.0)	1 (1.3)	
Marital status n(%)				
Married	44 (81.5)	23 (79.3)	56 (73.7)	$\chi^2_{(2, N=159)}$=1.74, p=.419; Cramer's V=.11
Partnered	4 (7.4)	1 (3.4)	5 (6.6)	
Separated	1 (1.9)	2 (6.9)	2 (2.6)	
Widowed	2 (3.7)	1 (3.4)	5 (6.6)	
Single	3 (5.6)	2 (6.9)	8 (10.5)	
Smoking status n(%)				
Smoker	6 (11.1)	6 (20.7)	14 (18.4)	$\chi^2_{(2, N=159)}$=1.72, p=.450; Cramer's V=.10
Non-smoker	48 (88.9)	23 (79.3)	62 (81.6)	
Age: M (SD)	64.9 (10.0)	66.2 (7.5)	65.8 (10.6)	$F_{(2,156)}$=0.20, p=.820, η^2=.00
BMI: M(SD)	28.1 (4.0)	29.5 (5.1)	27.7 (4.2)	$F_{(2,155)}$=1.94, p=.152, η^2=.02
Days from event to contact: M(SD)	52.7 (26.4)	42.7 (26.8)	46.1 (21.6)	$F_{(2,156)}$=1.93, p=.150, η^2=.02
Baseline depression	9.7[a] (4.0)	8.2[a] (3.8)	3.0[b] (2.8)	**$F_{(2, 156)}$=64.67, p<.001*, η^2=.45**
Baseline anxiety	10.8 [a] (3.4)	11.7 [a] (3.3)	3.3 [b] (2.9)	**$F_{(2, 156)}$=122.34, p<.001*, η^2=.61**
Baseline health anxiety	19.5[a] (4.2)	7.0 [b] (4.3)	7.4 [b] (3.1)	**$F_{(2, 156)}$=189.94, p<.001*, η^2=.71**
Baseline quality of life	20.4[a] (5.7)	21.6[a] (6.3)	17.1[b] (6.1)	**$F_{(2, 154)}$=7.94, p<.001*, η^2=.09**

*Statistically significant at least the a=.05 level, highlighted in bold for legibility.

[1] For comparative analyses, employment, marital, and ethnic status categories were collapsed due to small subgroup sizes. For employment, "full-time" and "student" were combined, "part-time" was not combined, and "retired" and "unemployed" were combined, to provide "full-time, part-time and not working". For marital status, "married" and "partnered" were combined, as were "single," "widowed," and "separated,", to provide "partnered or not partnered". Ethnic status was combined to "White British" and all others to provide "Not White British". These combinations were made to ensure sufficient cell counts for valid statistical comparison.

[2] Figures sharing a superscript within the same row denote that those groups did not significantly differ. For example, all figures with the superscript "a" in one row did not significantly differ, but did significantly differ from figures with superscript "b" in the same row.

The groups differed significantly in terms of gender distribution, with females overrepresented in the HA+AD group and males overrepresented in the non-clinical group, with a small-medium effect size. Partitioned chi-square analyses showed that this overall difference was driven by a significant difference between the HA+AD and non-clinical groups. The groups did not significantly differ by any other demographics.

It was hypothesised that the HA+AD group will have higher mental defeat and FRP than the AD only and non-clinical groups. This hypothesis was upheld for both mental defeat and FRP. For mental defeat, there was a significant main effect of group ($F_{(2, 156)}$=9.07, p<.001) with a medium-large effect size (Cohen's d≈0.76). As variances were unequal, ($F_{(2, 156)}$=5.94, p=.003), Dunnett's T3 was used for post hoc comparison. The HA+AD group reported significantly higher scores than the AD-only group (p=.048) and non-clinical group (p<.001). No significant difference was found between the AD-only and non-clinical groups.

For FRP, there was a significant main effect of group ($F_{(2, 156)}$=16.78, p<.001) with a large effect size (Cohen's d≈1.05). Tukey HSD was selected for post hoc comparison as no violations of parametric testing were found. This analysis indicated the HA+AD group scored significantly higher than the AD-only group (p=.016) and non-clinical group (p<.001). As with mental defeat, no significant difference was found between the AD-only and non-clinical groups. Between-groups scores for all measures are presented in Table 9.

Table 9

Means and standard deviations of all pre- and post-rehabilitation measures.

Measure	HA+AD group	AD-only group	Non-clinical group	Ungrouped (HA-only)	Full sample
SHAI [a]	19.5 (4.2)	7.0 (4.3)	7.4 (3.1)	19.5 (4.9)	12.2 (7.1)
MDSP [a]	37.6 (14.7)	30.8 (13.5)	28.3 (10.0)	40.9 (18.9)	32.8 (13.9)
WARPS [a]	58.5 (14.2)	48.2 (16.1)	43.5 (14.3)	61.9 (12.5)	50.7 (16.1)
DQoL					
Pre-rehab [a]	20.4 (5.7)	21.6 (6.3)	17.1 (6.1)	18.7 (3.9)	19.0 (6.0)
Post-rehab [b]	19.1 (3.8)	17.2 (4.6)	15.8 (4.9)	16.2 (4.5)	17.0 (4.7)
HADS-A					
Pre-rehab [a]	10.8 (3.4)	11.7 (3.3)	3.3 (2.9)	3.0 (2.4)	7.0 (5.0)
Post-rehab [b]	6.6 (3.8)	8.3 (3.4)	2.5 (2.6)	2.1 (3.4)	4.4 (4.0)
HADS-D					
Pre-rehab [a]	9.7 (4.0)	8.2 (3.8)	3.0 (2.8)	2.2 (2.0)	5.8 (4.6)
Post-rehab [b]	6.0 (4.2)	5.2 (3.1)	1.9 (2.4)	1.6 (2.4)	3.5 (3.6)
MET					
Pre-rehab [a]	4.9 (0.9)	4.7 (0.7)	4.9 (1.0)	5.2 (1.0)	4.9 (0.9)
Post-rehab [b]	5.4 (1.1)	5.6 (1.1)	5.9 (1.4)	5.8 (1.0)	5.7 (1.3)
BMI					
Pre-rehab [a]	28.1 (4.0)	29.5 (5.1)	27.7 (4.2)	27.4 (4.7)	28.1 (4.4)
Post-rehab [b]	28.0 (4.3)	29.2 (4.2)	27.2 (4.1)	27.0 (4.5)	27.7 (4.2)

[a] Sample size (n) for HA+AD=54, AD-only=29, Non-clinical=76, Ungrouped=17, Full sample=176

[b] Sample size (n) for HA+AD=29, AD-only=16, Non-clinical=52, Ungrouped=12, Full sample=109

3.3. Secondary hypothesis: adherence

Of the total sample (N=176), 27 were excluded due to not being offered rehabilitation, providing a main sample of 149. Of these, 109 (73.2%) were categorised as "adherent", and the remainder (n=40, 26.8%) "non-adherent". When analysed with binary logistic regression, the overall model was not statistically significant, $\chi^2_{(3,\ N=149)}$=3.80, p=.284, and explained 3.7% of the variance in adherence (Nagelkerke R^2=.037). None of the individual predictors were significant; further details are provided in Appendix Q. As such, neither health anxiety, mental defeat nor FRP were uniquely or together associated with cardiac rehabilitation adherence.

3.4.1. Secondary hypothesis: treatment outcomes by group

To assess differences in rehabilitation outcomes, mixed model (repeated measures) ANOVAS were conducted, with psychological group membership (HA+AD, AD-only, non-clinical) as the grouping variable and pre- and post-rehabilitation scores as repeated measures. This was done for fitness and quality of life. Across the full sample, there were significant improvements in both fitness and quality of life (both $p<.001$,) with large effect sizes (partial $\eta^2=.299$ for quality of life, partial $\eta^2=.354$ for fitness), indicating the rehabilitation programme was broadly effective. For fitness, there was no significant interaction between time and group, suggesting all groups improved similarly. However, for quality of life, a significant time-by-group interaction was observed ($F_{(2,95)}=4.25$, $p=.017$, $\eta^2=.082$), indicating improvement differed between groups. Post hoc comparisons showed this was driven by poorer quality of life improvements in the AD-only group relative to the non-clinical group. Full statistics are reported in Appendix R.

3.4.2. Secondary hypothesis: predictors of treatment outcomes

Having established the presence of improvements in fitness and quality of life following rehabilitation, multiple linear regressions examined whether health anxiety, mental defeat, and FRP uniquely or together predicted improvement. For fitness, the overall model was not significant, $F_{(3, 93)}=1.67$, $p=.178$, explaining 5.1% of the variance ($R^2=.051$), and none of the individual predictors were significant. Similarly, for quality of life, the overall model was not significant, ($F_{(3, 105)}=0.57$, $p=.637$, $R^2=.016$), with no individual predictors reaching significance.

When tested again using residual scores to adjust for baseline differences, the models remained non-significant for both fitness ($F_{(3, 93)}=1.45$, $p=.234$, $R^2=.045$) and quality of life ($F_{(3, 105)}=0.06$, $p=.981$, $R^2=.002$). Together, these findings indicate that neither health anxiety,

mental defeat, nor FRP were uniquely or jointly associated with change in fitness or quality of life following cardiac rehabilitation.

4. Discussion

The present study investigated the extent mental defeat and fear of recurrence and progression (FRP) present in post-event cardiac patients, whether these present more in those with health anxiety, and implications for rehabilitation adherence and outcomes. We hypothesised that patients with elevated health anxiety and anxiety or depression, would score significantly higher on measures of both mental defeat and FRP relative to patients with depression and/or anxiety alone, and patients without depression or anxiety. This was supported, with a medium-large effect size for mental defeat and a large effect size for FRP. Females were significantly more likely than males to experience health anxiety alongside depression and/or anxiety, and males significantly more likely to experience neither health anxiety nor depression/anxiety. Secondly, we hypothesised that health anxiety, mental defeat and FRP would be uniquely associated to poorer adherence, and psychological and physical improvements following rehabilitation. However, no evidence emerged to support this.

These findings are consistent with previous research demonstrating elevated health anxiety and related constructs across health and adjustment contexts (Hayter et al., 2016). While mental defeat has been studied more in trauma and pain populations (Tang et al., 2009; 2007), its presence in this sample highlights the perceived loss of agency cardiac events can evoke. Similarly, the concept of FRP, traditionally applied in oncology but more recently to other contexts (Sharpe et al., 2024), appears transferable to post-cardiac event patients, where recurrence fears and uncertainty are also prominent (Shah et al., 2020). Our gender-related

findings are also consistent with oncology literature, wherein females consistently report higher fear of recurrence than males (Pang & Humphris, 2021).

Although mental defeat and FRP were elevated in the health anxiety group, they were not directly associated with rehabilitation outcomes, consistent with literature showing psychological predictors of improvement are often mixed and non-linear (Yang et al., 2024). However, individuals with anxiety or depression alone showed less improvement in quality of life than the non-clinical group. Interestingly, this pattern was not observed in those with additional health anxiety.

4.1. Limitations

These findings should be interpreted considering several limitations. First, the outcome measures used to assess adherence, physical improvement, and quality of life were relatively crude in their sensitivity and granularity. For example, adherence was measured as a binary variable out of necessity, limiting sensitivity to partial engagement or varying levels of participation. Fitness was assessed using maximal-effort cycle tests, which may be influenced by motivation, external circumstances, or variability in testing conditions. Similarly, while quality of life offers a broad indicator of psychological and functional adjustment, it may obscure more nuanced psychological changes, and can be influenced by static or non-cardiac-related factors outside the scope of rehabilitation. However, these measures are standard clinical tools routinely used in BACPR-compliant settings, enhancing ecological validity and translational value of findings.

Secondly, the sample was recruited from a single UK-based cardiac rehabilitation service, which although typical and compliant with routine UK-based practice, limits generalisability in the international context. Thirdly, although the timing of the measures was similar across participants, individuals may follow different psychological trajectories after a

cardiac event, with distress emerging at different stages of adjustment. Future research could explore these temporal dynamics using more frequent time points, or qualitatively examine how symptoms differentially impact quality of life and rehabilitation efforts. Lastly, although residual change models were used to account for baseline variability, the low variance explained and non-significant findings suggest the study may have been underpowered to detect subtle associations, and the risk of Type II error should be considered.

4.2. Implications

Our findings contribute to the theoretical understanding of psychological adjustment following a cardiac event by highlighting the potential role of transdiagnostic processes such as health anxiety, mental defeat and FRP, which remain largely unexplored in this population. Individuals varied meaningfully in the degree to which they experience these processes, although unexpectedly, these were not linearly associated with rehabilitation outcomes. Although health anxiety, mental defeat and FRP did not show linear associations to rehabilitation outcomes, they may still have a meaningful role in recovery.

While this study was not designed to investigate gender as a primary variable, the overrepresentation of females in the health anxiety group warrants further exploration. Gendered experiences of cardiac rehabilitation referral, participation, and programme delivery (Smith et al., 2022), as well as systemic gender and cultural disparities in help-seeking behaviour and self-stigma following health diagnoses (Osokpo & Riegel, 2021; Whitaker et al., 2024) may be important in how rehabilitation efforts are differentially experienced following cardiac events. Future research should more explicitly examine demographic influences, ideally with larger and more diverse samples.

Clinically, our findings are encouraging in that most patients benefited from cardiac rehabilitation regardless of psychological profile. However, considering groups differed

significantly by baseline quality of life, relative differences persisted despite proportional gains. Importantly, approximately 30% of participants were categorised as “non-adherent”, for whom no physical or psychological outcomes were able to be measured, and represent a concerning group with potentially unmet needs. Further research is therefore needed to understand the characteristics and needs of non-completers, with additional research in early identification and tailored support for likely non-completers.

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Executive Summary

Why Was the Study Conducted?

Health anxiety is a condition characterised by debilitating preoccupation with the potential deterioration of one's health, regardless of whether the person has an attributable health condition. It affects around 1-5% of the population, which rises notably in those with health problems. Health anxiety may be transient in the immediate aftermath of a health event (such as involvement in an accident, diagnosis of a new condition, the decline or death of loved ones, or global health events such as pandemics), or can be prolonged and lead to a sustained impact on a person's life.

As improvements in healthcare have led to greater survival rates and prognosis from severe health events, the relevance of transient health anxiety has increased. The physical and psychological consequences of health-anxious reactions to health events are a complication of increasing concern but with substantial lack of comprehension. This study aimed to examine a number of variables related to health anxiety in those who had recently experienced a heart attack, and secondly examined whether these variables had an influence on the completion rates and success rates of a cardiac rehabilitation programme in an NHS service. Specifically, it examined whether mental defeat and fear of recurrence and progression were greater in those with health anxiety compared to active controls, and the variance explained by these variables, as well as health anxiety, anxiety and depression, in the completion and outcomes of cardiac rehabilitation.

What Was Done?

The study involved three groups of people:

1. Those with health anxiety and at least one of depression or anxiety (HA+AD)

2. Those without health anxiety, but with at least one of anxiety and/or depression (AD)
3. Those without health anxiety, anxiety or depression (Non-clinical)

Potential participants were individuals who had sustained a recent major cardiac event, which may include a heart attack, undergoing bypass surgery, stable heart failure, stable angina among other reasons. It is routine for patients presenting to hospital with major cardiac events to be referred for a cardiac rehabilitation programme. Participants were recruited during their first-contact clinical meetings with the cardiac rehabilitation team across sites at Oxford University Hospitals NHS Foundation Trust.

Participants who consented to be contacted received an online survey including several psychological questionnaires and a consent form for their hospital data to be extracted after completing their cardiac rehabilitation programme. A total of 176 people participated: 54 in the HA+AD group, 29 in the AD group, and 76 in the non-clinical group. The remaining 17 did not meet criteria for either group. Our primary hypothesis was that the health anxiety group would present with greater mental defeat and fear of recurrence and progression (FRP) than the other two groups.

Of the 176 who participated, 149 were offered rehabilitation. Of these, 109 completed rehabilitation and 40 either declined or did not complete. Our initial secondary hypothesis predicted the non-adherent group will have initially scored higher for health anxiety, mental defeat and FRP. In addition, we hypothesised that for individuals who completed rehabilitation, physical and psychological outcomes of rehabilitation would be poorer in those who scored higher for the aforementioned psychological variables.

What Was Found?

Our results supported our primary hypothesis; mental defeat was significantly greater in the health anxiety group with a medium-large effect size, and FRP with a large effect size.

We also noted that females were significantly more likely to be in the HA+AD group than other groups, and men in the non-clinical group. Additionally, although not significant, there was a trend towards Asian (mixed or other) ethnic groups being overrepresented in the HA+AD group. Both secondary hypotheses were unsupported, in that neither health anxiety, mental defeat nor FRP demonstrated any linear associations with adherence or outcomes (change in fitness or quality of life) after cardiac rehabilitation.

What Does This Mean?

Cardiac events are life-altering and often trigger complex psychological responses. Rehabilitation following such events are structured and demanding, requiring sustained engagement with exercise, diet and medication among other aspects. Psychological adjustment and reactions may play an increasingly appreciated role in how people are impacted by cardiac events and rehabilitative efforts. Our study explored the prevalence of specific constructs, namely mental defeat and FRP, in post-event patients, and examined how these influenced rehabilitation adherence and outcomes. While no linear observations were observed, we are confident these findings reflect the heterogeneity of psychological responses and their implications for rehabilitation. For example, psychological impacts may be adaptive in some contexts and maladaptive in others; present transiently for some and persist long-term for others. Understanding individual variation is vital for maximising treatment efficacy, which was undetected by our findings. Given the global burden of cardiovascular disease, it was nevertheless interesting that the broader pattern of symptom severity associating negatively with rehabilitation outcomes, which we expected, did not occur. There are numerous avenues we hope this research may inspire, such as motivating exploration of differing trajectories of psychological responses, the adaptive and maladaptive nature of certain responses, and the influence of wider psychosocial variables in the rehabilitation process.

Connecting Reflective Narrative

A Personal Perspective

There are many advantages to the Oxford DClinPsych course, other than allowing your parents to say *"My son's at Oxford"* to everyone they pass in the street. The range of expertise within the course and wider Thames Valley region enabled me to broaden my research and clinical practice across several areas of interest. This combination of breadth and depth has given me a clearer sense of my short- and medium-term professional goals, and greater confidence in the ever-evolving field of Clinical Psychology.

Theoretically Driven Research Project

Before training, my research focused mainly on cardiovascular disease and depression. Although I hoped to explore new areas during the DClinPsych, it was important that my main research project contributed meaningfully to this field. I had long been frustrated by papers citing strong prognostic links between depression and physical health, followed by statements to the effect of *"further research is needed to examine the mechanisms".* I could not tell if anyone was actually looking at mechanisms, or just stating it needs to be done. The potential mechanisms expressed were all of a running theme: *"autonomic dysfunction, oxidate stress, allostatic load…"* among other physiological variables, followed by *"the directionality of these associations also require exploring".* I felt uninspired to start a career wondering whether one physiological variable was more related to depression than another, and whether this contributed to the depression or the other way round. Knowing *"broadly speaking, worse mental health means worse physical health",* was enough for me: disadvantage in any domain of life is associated to worse mental health. I felt, and continue to feel, that extending this to clinically useful models was more aligned to my long-term goals.

With this in mind, investigating psychological processes in cardiovascular conditions, and their outcomes for prognosis, was precisely where I wished to situate my DClinPsych research. The development of this project was supported by Paul Salkovskis' prior research on health anxiety, and Louise Sharpe's recent research on responses to health events. Luck also played a part: Oxford University Hospital NHS-FT had just appointed a Clinical Psychologist to their cardiac rehabilitation team as I was seeking a research site. This led me to Sarah Scott, who, two years later, became both the supervisor for this project and my final-year elective placement.

Systematic Review

Continuing with the theme of body- and change-related distress, I developed a strong interest during training in phenomena related to body image. I had followed the research on body dysmorphic disorder (BDD) for some time and, as with physical health conditions, I noticed many reviews highlighted the breadth of associated disadvantage but paid relatively little attention to mechanisms. Much of the first-year teaching on the DClinPsych encouraged us to examine therapeutic mechanisms of change, which led me to explore the developmental, maintaining, and treatment-related processes underpinning BDD.

Discussing these interests in early months of the course, I was encouragingly met with interest from several staff about a systematic review into this area. This was coupled with expertise in mental imagery (a term I was unfamiliar with prior to training) from several course staff (Myra Cooper, Craig Steel and Alex Lau-Zhu), which piqued a newfound interest in this apparently abstract but profoundly important concept. Mental imagery refers to any internal generation of sensory experience, whether that be replaying memories, having a song stuck in your head, retracing your steps after losing your keys, and so on. As a natural, intuitive process in daily life, it is understandably recognised as significant across

psychological disorders. In conditions involving self-focused attention, imagery can play a central role.

Arguably the most presiding clinical model of BDD, David Veale's "self as an aesthetic object" model places imagery at the core of how individuals perceive their self-worth through their appearance. Professor Veale and I met twice during the start of 2023, and alongside Matthew Hotton and Alex Lau-Zhu's expertise in body-image related conditions and mental imagery, developed the present systematic review.

Service Improvement Project

Although my prior roles involved service development and progress monitoring, I had not undertaken a service-based project with the same level of precision and independence as this service improvement project. Seeking to broaden my research beyond physical health, I chose to complete this project within an eating disorder service. In my first term, I was fortunate to connect with Layla Hamadi, who worked in an adult inpatient eating disorder unit within the same hospital as our course.

In the months leading up to my move to Oxford, the service had identified difficulties with the relevance of standardised outcome measures in the inpatient setting, with service users reporting the tools felt largely disconnected from their hospital experience. These tools, the Eating Disorder Examination Questionnaire (EDE-Q) and Clinical Impairment Assessment (CIA), are widely used across eating disorder care pathways. However, many of their items lose applicability in inpatient settings due to hospital restrictions. For instance, they include questions about eating in secret, social isolation, or using laxatives, all of which are often infeasible by inpatient rules. In such cases, it is the context, not psychopathology, that restricts behaviour, thereby undermining the validity of the measures and leaving service users feeling patronised or dehumanised.

Supporting inpatient services felt deeply meaningful to me, as nearly all my clinical experience prior to the course was within such settings. My awareness of the transformative potential of inpatient care made this project a significant part of my training.

Conclusion

When I consider what I hoped for my clinical training and my career beyond, the research component of the DClinPsych has been central in determining whether my pre-training hopes would be met. Each project contributed to my growth as a Clinical Psychologist and academic researcher, and I am filled with gratitude for both the support I received along the way, and the challenges I faced, as both of these have culminated in fostering my genuine passion for applied clinical research, and demonstrated to me the enormous potential of Clinical Psychologists in enacting change through research.

Acknowledgements

This thesis will remain an artefact of my completion of the DClinPsych at the University of Oxford, and the beginnings of my career as a qualified Clinical Psychologist. The decision to begin this career began somewhat offhandedly during the summer of 2016: I first heard of and learnt what a Clinical Psychologist was during my A-Level studies, and only after completing my exams and already making the decision to start an undergraduate degree in Psychology that September, had I thought *'Where can I actually go with this?'.* Those thoughts made me reflect on times of feeling unable to support people with their mental health difficulties, and wondered if learning to do so might bring some small positive change to the world. I progressed down the route of a Psychology undergraduate degree, gaining various clinical and research experiences, which at each stage have continually affirmed this was the professional route I wanted to take.

During my undergraduate placement year, I attended the 2019 Clinical Psychology Research Conference at Newcastle University. The keynote speaker was Professor Paul Salkovskis, whose talk was titled 'Integrating Research and Clinical Practice'. The talk was in many ways Paul's reflections on his first year of running the Oxford DClinPsych course, and how he was adapting the course to provide a well-rounded, demanding but highly supportive structure for trainees. As an impressionable aspiring psychologist, who had pretty much decided the DClinPsych was the path for me, I walked away from that talk and thought, *'You know what, I want to train at Oxford'.*

Now nine years after finishing my A levels, there is a whole cast of people and circumstances that have partial responsibility for me writing this today. I couldn't possibly list them all, which include the researchers, psychologists, lecturers, support workers, service users, MDT members, family, friends, global pandemics, cost-of-living crises, opportunities, missed opportunities, strokes of good luck, bad luck, meticulously planned events and

complete chance encounters, which were part of this journey both pre-training and throughout the course. Like all stages before this, training is not an endpoint but another road in the journey. The road ahead is unwritten, and like all before it, is shaped by both choice and chance. I welcome each moment as they pave the road ahead. I cannot take full credit for what it has taken to reach this point, and wish to acknowledge just some of the people who contributed to me submitting this thesis today.

DClinPsych: Thank you to the DClinPsych course team, especially the following people who were closely involved with my work on the course; Paul Salkovskis, Neil Carrigan, Aimee McKinnon, Alex Lau-Zhu, Ciorsdan Anderson, Emily Reeves, Fiona Challacombe, Hjördis Lorenz, Louise Johns, Matthew Hotton and Matthew Knight. Further thanks to Tiago Zortea, Yusuf Rasul and Colm Ellis-Nee who I was paired with through the course's buddy system, and to Liam Myles, John Kerr and Martha Wallace in my cohort, who have become among of my biggest sources of motivation (and knowledge) over the past three years.

Clinical Placements: Thank you to Jen Potter-James, Denise Barulis, Rajan Kumar, Daniel Watts, Katherine Siu, Stephanie Baker, Nazakat Wagle, Gillian Nightall, Sarah Walden, Sarah Coles, Sarah Scott and Lucinda Dixon for supervising my clinical placements.

Pre-training roles: Further thanks to Lucy Robinson, Sarah Stringfellow, Beth Harrison and Lizzi Wakeland, for supervising me in my Assistant Psychologist roles. The skills and lessons taught by you placed me in excellent stead for clinical training, and I am eternally grateful. Thanks to Stuart Watson, Tiago Costa, Hamish McAllister-Williams, Mike Marriott and Niamh McNamara for the research opportunities. Lastly, a huge expression of gratitude to Alfie Vaughan (at the time of writing, soon to be Dr Alfie Vaughan, DForenPsy), who began their psychology journey alongside me. Your support, drive, and inspiration have continually

pushed me to become the best version of myself in this career; thank you for being a friend and professional colleague for life. Here's to the 30-minute+ voice notes.

Appendices

Systematic Review Appendices

Appendix A: Body Image Guide for authors

About the journal

Aims and scope

Body Image is an international, peer-reviewed journal that publishes high-quality, scientific articles on body image and human physical appearance. Body image represents a person's "inside view" of their body-that is, their feelings, perceptions, thoughts, and beliefs about their body that impact how they behave toward it (Cash, 2004). While physical appearance is an important aspect of body image, it is not the only aspect, as embodiment (how a person uses their body to engage with the world) and focusing on (and appreciating) body functionality are additional aspects of body image. We invite contributions from a broad range of disciplines - psychological science, other social and behavioral sciences, and medical and health sciences. We have a weight-inclusive focus rather than a weight-normative or weight-centric focus (see https://www.hindawi.com/journals/jobe/2014/983495/ for an explanation).

Body Image publishes a variety of article types, including original research articles, brief research reports, theoretical and review papers (systematic reviews and meta-analyses), scale development and adaptation articles, replication studies, protocol articles, methodological innovations that could be used to advance body image research, unexpected/null results articles, and ideas worth researching. We encourage articles that center minoritized populations. Consistent with the Open Science initiative, we publish articles based on a strong theoretical rationale and scientific design rather than whether findings are statistically significant.

We also encourage review-based and empirical-based special issues, especially those that bridge subfields and disciplines.

Suitable topics for submission of manuscripts include (but are not limited to):

- The effects of body image and physical characteristics (e.g., body size, attractiveness, physical disfigurements or disorders) on psychological functioning, interpersonal processes, and quality of life;
- Body image and physical appearance in the full range of medical and allied health contexts;

- Body image in diverse cultural contexts;
- Development, validation, and adaptation (e.g., translation) of assessments of the body image construct;
- Factors that influence positive and negative body image development;
- Stigmatization and discrimination based on appearance and/or body function;
- Adaptive and maladaptive body image processes and their clinically relevant consequences on psychosocial functioning and quality of life;
- Relationship of body image to behavioral variables (e.g., exercise and other physical activity, eating and weight-control behaviors, grooming and appearance-modifying behaviors, and social behaviors);
- How body image may shape the ways we engage our bodies with the world (i.e., embodiment);
- Scientific evaluation of interventions to promote positive body image or to prevent or treat body image difficulties and disorders.

Impartiality statement regarding citations. We, the editorial team, strongly encourage authors to cite the highest quality work believed to be most relevant to their article; we are impartial to the use of citations from Body Image versus other journals. We review and accept articles based on their scientific rationale, merits, design, analysis, and interpretation rather than the source of their citations.

Note regarding string citations. We encourage authors to avoid excessive string citations, whereby multiple citations support a *single* statement, finding, or proposition, when such citations would be superfluous. In many cases, one citation will suffice, and this citation should be the best supporting reference for that statement, finding, or proposition. All important previous work can be included, and if a cite is important, there often will be additional text that accompanies it. Please note that we are okay with the overall number of references.

Of note, the recommendation to avoid string citations does not apply to:

1. Statements that include more than one finding. For example, "Over the past 10 years, researchers in a number of countries have begun to explore the relationship between positive body image and psychological well-being" needs multiple citations because authors are referring to researchers and countries (both plural. However, reference to all work that has explored this relationship is probably not needed.
   As another example, "research shows that body dissatisfaction is correlated with disordered eating, anxiety, and depression" may include multiple citations, with different citations supporting different aspects of this statement.
2. Systematic reviews and meta-analyses whereby the citations are linked to relevant themes/data that are included in the analysis.

The presence of string citations alone is not a reason to reject an article. If submitted articles contain string citations, the editorial team will simply note this, and it will be up to the author to decide whether to retain or remove citations if asked to revise and resubmit their article.

Benefits to authors
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Please see our Guide for Authors for information on article submission. If you require any further information or help, please visit our Support Center.

The journal gives an annual award for the best doctoral dissertation in this field.

Article types

1. Full-length articles of the following types:

- **Original research articles** (studies that do not fit one of the other types listed below)
- **Systematic reviews / meta-analyses** (please follow PRISMA checklist: http://www.prisma-statement.org/
- **Methodological / protocol articles** (articles that explicate an innovative research study design in which data are currently being collected)
- **Unexpected / null results articles** (articles grounded in extant theory that have a sound methodological design and adequate statistical power and are analyzed appropriately, but primary hypotheses were not supported)
- **Scale development / adaptation articles** (multi-study/sample articles that investigate the psychometric properties of a newly developed or existing scale relevant to body image; scale translations and applications to different samples are welcome)
- **Replication studies** (consistent with Open Science initiatives, we encourage articles that replicate--or fail to replicate--existing body image research)
- **Theoretical review articles** (typically invited; however, if you have an idea, propose it to the Editor-in-Chief)

Please choose the article type that is the best fit for your article (we realize that some articles may fit into more than one type).

While full-length articles have no explicit limits in terms of numbers of words, tables/figures, and references, an article's length must be justified by its empirical strength and the significance of its contribution to the literature.

2. Shorter communications of the following types:

- **Brief research reports** (articles with a more defined and/or limited focus than original research articles)
- **Ideas worth researching** (articles that propose a novel idea for advancing research on body image)
- **Methodological innovations** (articles that discuss the application of a novel statistical approach to the study of body image)

Guidelines for short communications are <= 3000 words from Introduction through Discussion and <= 30 references. There are no limits on tables and figures

3. Themed special issues

- **Theoretical special issue** (a collection of review articles from experts in the body image field that focus on a relevant body image topic)
- **Empirical special issue** (a collection of empirical articles that offer novel insights into a relevant body image topic)
- **Data set special issue** (a collection of empirical articles that emerge from the same, large data set; each article within the issue must be incremental and overlapping data between articles must be minimal)

We especially encourage special issues that bridge body image theory and research with other disciplines and social science constructs.
Please contact Editor-in-Chief to propose your idea for a special issue.

If you are proposing a theoretical or empirical special issue and it is accepted, you will be the Guest Editor(s) and work with the Editor-in-Chief (or an Associate Editor) and our Special Issue Journal Manager to develop and prepare your special issue.

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- Any addition, deletion or rearrangement of author names in the authorship list should only be made prior to acceptance, and only if approved by the journal editor.
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Declaration of interests

All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence or bias their work. Examples of potential competing interests include:

- Employment
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- Honoraria
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- Patent applications or registrations
- Grants or any other funding

The Declaration of Interests tool should always be completed.

Authors with no competing interests to declare should select the option, "I have nothing to declare".

The resulting Word document containing your declaration should be uploaded at the "attach/upload files" step in the submission process. It is important that the Word document is saved in the .doc/.docx file format. Author signatures are not required.

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Authors must disclose any funding sources who provided financial support for the conduct of the research and/or preparation of the article. The role of sponsors, if any, should be declared in relation to the study design, collection, analysis and interpretation of data, writing of the report and decision to submit the article for publication. If funding sources had no such involvement this should be stated in your submission.

List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants, scholarships and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, it is recommended to include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of generative AI in scientific writing

Authors must declare the use of generative AI in scientific writing upon submission of the paper. The following guidance refers only to the writing process, and not to the use of AI tools to analyse and draw insights from data as part of the research process:

- Generative AI and AI-assisted technologies should only be used in the writing process to improve the readability and language of the manuscript.
- The technology must be applied with human oversight and control and authors should carefully review and edit the result, as AI can generate authoritative-sounding output that can be incorrect, incomplete or biased. Authors are ultimately responsible and accountable for the contents of the work.
- Authors must not list or cite AI and AI-assisted technologies as an author or co-author on the manuscript since authorship implies responsibilities and tasks that can only be attributed to and performed by humans.

The use of generative AI and AI-assisted technologies in scientific writing must be declared by adding a statement at the end of the manuscript when the paper is first submitted. The statement will appear in the published work and should be placed in a new section before the references list. An example:

- Title of new section: Declaration of generative AI and AI-assisted technologies in the writing process.
- Statement: During the preparation of this work the author(s) used [NAME TOOL / SERVICE] in order to [REASON]. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the published article.

The declaration does not apply to the use of basic tools, such as tools used to check grammar, spelling and references. If you have nothing to disclose, you do not need to add a statement.

Please read Elsevier's author policy on the use of generative AI and AI-assisted technologies, which can be found in our GenAI Policies for journals.

Please note: to protect authors' rights and the confidentiality of their research, this journal does not currently allow the use of generative AI or AI-assisted technologies such as ChatGPT or similar services by reviewers or editors in the peer review and manuscript evaluation process, as is stated in our GenAI Policies for journals. We are actively evaluating compliant AI tools and may revise this policy in the future.

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Use of inclusive language

Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Authors should ensure their work uses inclusive language throughout and contains nothing which might imply one individual is superior to another on the grounds of:

- age
- gender
- race
- ethnicity
- culture
- sexual orientation
- disability or health condition

We recommend avoiding the use of descriptors about personal attributes unless they are relevant and valid. Write for gender neutrality with the use of plural nouns ("clinicians, patients/clients") as default. Wherever possible, avoid using "he, she," or "he/she."

No assumptions should be made about the beliefs of readers and writing should be free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions.

These guidelines are meant as a point of reference to help you identify appropriate language but are by no means exhaustive or definitive.

Reporting sex- and gender-based analyses

There is no single, universally agreed-upon set of guidelines for defining sex and gender. We offer the following guidance:

- Sex and gender-based analyses (SGBA) should be integrated into research design when research involves or pertains to humans, animals or eukaryotic cells and when sex and gender is relevant for the study outcome. This should be done in accordance with any requirements set by funders or sponsors and best practices within a field.
- Sex and/or gender dimensions of the research should be addressed within the article or declared as a limitation to the generalizability of the research.
- Definitions of sex and/or gender applied should be explicitly stated to enhance the precision, rigor and reproducibility of the research and to avoid ambiguity or conflation of terms and the constructs to which they refer.

We advise you to read the Sex and Gender Equity in Research (SAGER) guidelines and the SAGER checklist (PDF) on the EASE website, which offer systematic approaches to the use of sex and gender information in study design, data analysis, outcome reporting and research interpretation.

For further information we suggest reading the rationale behind and recommended use of the SAGER guidelines.

Definitions of sex and/or gender

We ask authors to define how sex and gender have been used in their research and publication. Some guidance:

- Sex generally refers to a set of biological attributes that are associated with physical and physiological features such as chromosomal genotype, hormonal levels, internal and external anatomy. A binary sex categorization (male/female) is usually designated at birth ("sex assigned at birth") and is in most cases based solely on the visible external anatomy of a newborn. In reality, sex categorizations include people who are intersex/have differences of sex development (DSD).
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Authors must follow ethical guidelines for studies carried out in humans and animals.

Studies in humans

Work which involves the use of human subjects should be carried out in accordance with the World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects.

Manuscripts should follow the International Committee of Medical Journal Editors (ICMJE) recommendations for the conduct, reporting, editing and publication of scholarly work in medical journals and aim to be representative of human populations in terms of sex, age and ethnicity. Sex and gender terms should be used correctly, as outlined by WHO (World Health Organization).

Manuscripts must include a statement that all procedures were performed in compliance with relevant laws and institutional guidelines and have been approved by the appropriate institutional committee(s). The statement should contain the date and reference number of the ethical approval(s) obtained.

Manuscripts must also include a statement that the privacy rights of human subjects have been observed and that informed consent was obtained for experimentation with human subjects.

This journal will not accept manuscripts that contain data derived from unethically sourced organs or tissue, including from executed prisoners or prisoners of conscience, consistent with recommendations by Global Rights Compliance on Mitigating Human Rights Risks in Transplantation Medicine. For all studies that use human organs or tissues, sufficient evidence must be provided that these were procured in line with WHO Guiding Principles on Human Cell, Tissue and Organ Transplantation. For clinical studies, a statement of informed consent having been obtained from a patient or their nominated representative, paired with ethical approval for the study from a suitable institution, as required by the policies of the journal, may be considered sufficient evidence, but the journal reserves the right to request additional evidence in cases where it feels this is not sufficient. The source of the organs or tissues used in clinical research must be transparent and traceable. If your manuscript describes organ transplantation you must additionally declare within the manuscript that:

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All animal experiments should comply with ARRIVE (Animal Research: Reporting of In Vivo Experiments) guidelines.

Studies should be carried out in accordance with Guidance on the operation of the Animals (Scientific Procedures) Act 1986 and associated guidelines, EU Directive 2010/63 for the protection of animals used for scientific purposes or the NIH (National Research Council)

Guide for the Care and Use of Laboratory Animals (PDF) or those of an equivalent internationally recognized body.

The sex of animals, and where appropriate, the influence (or association) of sex on the results of the study must be indicated and a statement included in your manuscript that such guidelines as listed above have been followed.

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We ask you to provide editable source files for your entire submission (including figures, tables and text graphics). Some guidelines:

- Save files in an editable format, using the extension .doc/.docx for Word files and .tex for LaTeX files. A PDF is not an acceptable source file.
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- Use spell-check and grammar-check functions to avoid errors.

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The title page should include:

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- Author name(s)
- Affiliation(s)
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The anonymized manuscript should contain the main body of your paper including:

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You are required to include the following details in the title page information:

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You are required to provide a concise and factual abstract which does not exceed 250 words. The abstract should briefly state the purpose of your research, principal results and major conclusions. Some guidelines:

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- Avoid references. If any are essential to include, ensure that you cite the author(s) and year(s).

- Avoid non-standard or uncommon abbreviations. If any are essential to include, ensure they are defined within your abstract at first mention.

Keywords

You are required to provide 1 to 7 keywords for indexing purposes. Keywords should be written in English. Please try to avoid keywords consisting of multiple words (using "and" or "of").

We recommend that you only use abbreviations in keywords if they are firmly established in the field.

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You are required to provide article highlights at submission.

Highlights are a short collection of bullet points that should capture the novel results of your research as well as any new methods used during your study. Highlights will help increase the discoverability of your article via search engines. Some guidelines:

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You are encouraged to provide a graphical abstract at submission.

The graphical abstract should summarize the contents of your article in a concise, pictorial form which is designed to capture the attention of a wide readership. A graphical abstract will help draw more attention to your online article and support readers in digesting your research. Some guidelines:

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- Ensure the image is a minimum of 531 x 1328 pixels (h x w) or proportionally more and is readable at a size of 5 x 13 cm using a regular screen resolution of 96 dpi.
- Our preferred file types for graphical abstracts are TIFF, EPS, PDF or MS Office files.

We encourage you to view example graphical abstracts and read about the benefits of including them.

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- Submit math equations as editable text, not as images.
- Present simple formulae in line with normal text, where possible.

- Use the solidus (/) instead of a horizontal line for small fractional terms such as X/Y.
- Present variables in italics.
- Denote powers of e by exp.
- Display equations separately from your text, numbering them consecutively in the order they are referred to within your text.

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Tables must be submitted as editable text, not as images. Some guidelines:

- Place tables next to the relevant text or on a separate page(s) at the end of your article.
- Cite all tables in the manuscript text.
- Number tables consecutively according to their appearance in the text.
- Please provide captions along with the tables.
- Place any table notes below the table body.
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We recommend that you use tables sparingly, ensuring that any data presented in tables is not duplicating results described elsewhere in the article.

Figures, images and artwork

Figures, images, artwork, diagrams and other graphical media must be supplied as separate files along with the manuscript. We recommend that you read our detailed artwork and media instructions. Some excerpts:

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- Cite all images in the manuscript text.
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When your artwork is finalized, "save as" or convert your electronic artwork to the formats listed below taking into account the given resolution requirements for line drawings, halftones, and line/halftone combinations:

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- files that are too low in resolution (for example, files optimized for screen use such as GIF, BMP, PICT or WPG files).
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All images must have a caption. A caption should consist of a brief title (not displayed on the figure itself) and a description of the image. We advise you to keep the amount of text in any image to a minimum, though any symbols and abbreviations used should be explained.

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We encourage the use of supplementary materials such as applications, images and sound clips to enhance research. Some guidelines:

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- Submit supplementary materials at the same time as your article. Be aware that all supplementary materials provided will appear online in the exact same file type as received. These files will not be formatted or typeset by the production team.
- Include a concise, descriptive caption for each supplementary file describing its content.
- Provide updated files if at any stage of the publication process you wish to make changes to submitted supplementary materials.
- Do not make annotations or corrections to a previous version of a supplementary file.
- Switch off the option to track changes in Microsoft Office files. If tracked changes are left on, they will appear in your published version.

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This journal accepts video material and animation sequences to support and enhance your scientific research. We encourage you to include links to video or animation files within articles. Some guidelines:

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We are committed to supporting the storage of, access to and discovery of research data, and our research data policy sets out the principles guiding how we work with the research community to support a more efficient and transparent research process.

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You are **required** to:

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Data statement

To foster transparency, you are encouraged to state the availability of any data at submission.

Ensuring data is available may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you can state the reason why (e.g., your research data includes sensitive or confidential information such as patient data) during the submission process. This statement will appear with your published article on ScienceDirect.

Read more about the importance and benefits of providing a data statement.

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Linking to the data underlying your work increases your exposure and may lead to new collaborations. It also provides readers with a better understanding of the described research.

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Divide your manuscript into clearly defined sections covering all essential elements using headings.

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Corresponding authors are required to acknowledge co-author contributions using CRediT (Contributor Roles Taxonomy) roles:

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List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants, scholarships and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, it is recommended to include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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We ask you to use the following format for appendices:

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- Give separate numbering to formulae and equations within appendices using formats such as Eq. (A.1), Eq. (A.2), etc. and in subsequent appendices, Eq. (B.1), Eq. (B. 2) etc. In a similar way, give separate numbering to tables and figures using formats such as Table A.1; Fig. A.1, etc.

References

References within text

Any references cited within your article should also be present in your reference list and vice versa. Some guidelines:

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- We recommend that you do not include unpublished results and personal communications in your reference list, though you may mention them in the text of your article.
- Any unpublished results and personal communications included in your reference list must follow the standard reference style of the journal. In substitution of the publication date add "unpublished results" or "personal communication."
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Linking to cited sources will increase the discoverability of your research.

Before submission, check that all data provided in your reference list are correct, including any references which have been copied. Providing correct reference data allows us to link to abstracting and indexing services such as Scopus, Crossref and PubMed. Any incorrect surnames, journal or book titles, publication years or pagination within your references may prevent link creation.

We encourage the use of Digital Object Identifiers (DOIs) as reference links as they provide a permanent link to the electronic article referenced.

Reference style

Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the *Publication Manual of the American Psychological Association,* Seventh Edition (2020) ISBN 978-1-4338-3215-4.

The reference list should be arranged alphabetically and then chronologically. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication.

Examples:

Reference to a journal publication:

Van der Geer, J., Handgraaf T., & Lupton, R. A. (2020). The art of writing a scientific article. J*ournal of Scientific Communications, 163*, 51–59. https://doi.org/10.1016/j.sc.2020.00372.

Reference to a journal publication with an article number:

Van der Geer, J., Handgraaf, T., & Lupton, R. A. (2022). The art of writing a scientific article. *Heliyon, 19,* Article e00205. https://doi.org/10.1016/j.heliyon.2022.e00205.

Reference to a book:

Strunk, W., Jr., & White, E. B. (2000). *The elements of style (4th ed.)*. Longman (Chapter 4).

Reference to a chapter in a book:

Mettam, G. R., & Adams, L. B. (2020). How to prepare an electronic version of your article. In B. S. Jones, & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281–304). E-Publishing Inc.

Reference to a website:

Powertech Systems. (2022). Lithium-ion vs lead-acid cost analysis. Retrieved from *http://www.powertechsystems.eu/home/tech-corner/lithium-ion-vs-lead-acid-cost-analysis/.* Accessed January 6, 2022.

Reference to a dataset:

Oguro, M., Imahiro, S., Saito, S., & Nakashizuka, T. (2015). *Mortality data for Japanese oak wilt disease and surrounding forest compositions [dataset]*. Mendeley Data, v1. https://doi.org/10.17632/xwj98nb39r.1.

Reference to a conference paper or poster presentation:

Engle, E.K., Cash, T.F., & Jarry, J.L. (2019, November). The Body Image Behaviours Inventory-3: Development and validation of the Body Image Compulsive Actions and Body Image Avoidance Scales. Poster session presentation at the meeting of the Association for Behavioural and Cognitive Therapies, New York, NY.

Reference to software:

Coon, E., Berndt, M., Jan, A., Svyatsky, D., Atchley, A., Kikinzon, E., Harp, D., Manzini, G., Shelef, E., Lipnikov, K., Garimella, R., Xu, C., Moulton, D., Karra, S., Painter, S., Jafarov, E., & Molins, S. (2020). *Advanced Terrestrial Simulator (ATS) (Version 0.88) [Computer software].* Zenodo. https://doi.org/10.5281/zenodo.3727209.

Web references

When listing web references, as a minimum you should provide the full URL and the date when the reference was last accessed. Additional information (e.g. DOI, author names, dates or reference to a source publication) should also be provided, if known.

You can list web references separately under a new heading directly after your reference list or include them in your reference list.

Data references

We encourage you to cite underlying or relevant datasets within article text and to list data references in the reference list.

When citing data references, you should include:

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- dataset title
- data repository
- version (where available)
- year
- global persistent identifier

Add [dataset] immediately before your reference. This will help us to properly identify the dataset. The [dataset] identifier will not appear in your published article.

Preprint references

We ask you to mark preprints clearly. You should include the word "preprint" or the name of the preprint server as part of your reference and provide the preprint DOI.

Where a preprint has subsequently become available as a peer-reviewed publication, use the formal publication as your reference.

If there are preprints that are central to your work or that cover crucial developments in the topic, but they are not yet formally published, you may reference the preprint.

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If you use a citation plug-in from these products, select the relevant journal template and all your citations and bibliographies will automatically be formatted in the journal style. We advise you to remove all field codes before submitting your manuscript to any reference management software product.

If a template is not available for this journal, follow the format given in examples in the reference style section of this Guide for Authors.

Appendix B: PRISMA Checklist

PRISMA Main Checklist

Topic	No.	Item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Title
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	1.3.
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	1.4.
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	2.2.
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	2.3.
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	2.4.
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	2.5.
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	2.5.

Topic	No.	Item	Location where item is reported
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	n/a
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	n/a
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	2.6.
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	n/a
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item 5)).	2.7.
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	2.7.
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	2.7.
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	2.7.
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	n/a
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	n/a
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	n/a

Topic	No.	Item	Location where item is reported
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	n/a
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	3.1.
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	n/a
Study characteristics	17	Cite each included study and present its characteristics.	3.2. , 3.3.
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	3.1.1.
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	3.2.1., 3.2.2., 3.3.1., 3.3.2., 3.3.3.
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	3.4.1., 3.4.2.
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	n/a
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	n/a
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	n/a
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	n/a
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	n/a
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	4.
	23b	Discuss any limitations of the evidence included in the review.	4.2.

Topic	No.	Item	Location where item is reported
	23c	Discuss any limitations of the review processes used.	4.3.
	23d	Discuss implications of the results for practice, policy, and future research.	4.1.
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	2.1.
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	2.1.
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	n/a
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Abstract
Competing interests	26	Declare any competing interests of review authors.	Covering page
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	2.4. (Appendix C), 3.3. (Appendix E)

PRISMA Abstract Checklist

Topic	No.	Item	Reported?
TITLE			
Title	1	Identify the report as a systematic review.	Yes
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Yes
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	No

Topic	No.	Item	Reported?
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	No
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	Yes
Synthesis of results	6	Specify the methods used to present and synthesize results.	Yes
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Yes
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	Yes
DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	Yes
Interpretation	10	Provide a general interpretation of the results and important implications.	Yes
OTHER			
Funding	11	Specify the primary source of funding for the review.	Yes
Registration	12	Provide the register name and registration number.	Yes

Appendix C. Author Background Position Statement

In systematic reviews using narrative methods of synthesis, interpretation plays a key role in shaping conclusions. Given the subjective nature of these methods, the authors' professional backgrounds and experiences may influence how the evidence is analysed. This statement provides transparency about our backgrounds to ensure readers can critically assess any potential biases in our interpretation and findings.

The lead author SH was involved in all stages of project design, data collection and analysis. At the time of writing, SH was a Trainee Clinical Psychologist who identified as White British, male, without lived experience of BDD. SH was employed by the National Health System (NHS) in the United Kingdom and had experience of providing psychological interventions to adults (age 18-65) and older adults (age 65+) with body image-related concerns using a cognitive-behavioural therapy model.

Author MH served as a supervisor for the review. He was a Clinical Psychologist who identified as a White British male, without lived experience of BDD. He has worked clinically with individuals with body image concerns, particularly relating to cleft or craniofacial conditions.

Author DV served as a supervisor for the review. He was a Consultant Psychiatrist who has worked with BDD clinically and in research. He authored a cognitive-behavioural model of BDD including imagery.

Author MW served as an independent reviewer for the review. She was a Trainee Clinical Psychologist who identified as a White British female, without lived experience of BDD. She has worked delivering psychological care and interventions to individuals of all ages, and across both physical and mental health settings.

Author ALZ served as lead supervisor for the review. He is a Clinical Psychologist and Researcher who identified as Peruvian-Chinese male, uses pronouns he/they, without lived experience of BDD. He primarily works clinically with adolescents with trauma and anxiety-related presentations in the UK NHS, and conducts a clinical research program on understanding mental imagery's role in youth mental health.

Appendix D. Qualitative synthesis deriving descriptive and analytical themes from coding labels assigned to verbatim results/findings of each included study, in accordance with Thomas & Harden (2008)

Quote	Article	Initial code	Descriptive theme	Analytical theme
pleasant sessions of exercise workout (past and present) focusing on muscles and feeling strong	Ghaderi et al., (2022)	strong feeling, muscle body part, past and present time location	Body part of imagery	Content
misfit of different outfits, being big, heavy and clumsy,	Ghaderi et al., (2022)	weight and shape, outfits		
bad skin, pimples, big belly, aging body, being boney with many scars, being too fat,	Ghaderi et al., (2022)	skin, blemishes, stomach, age, bones, scars, fat		
looking bigger than one actually is,	Ghaderi et al., (2022)	imagery bigger than perceived self		
the aspect of the appearance that received the criticism went on to become an area of concern and distress for the participant.	Craythorne et al., (2022)	congruence between area bullied for and bdd area of concern		
Participants' responses were subsequently coded for the presence or absence of each factor (coded as 0 or 1).	Onden-Lim & Grisham, (2012)	Coding was to presence and absence of certain features		
The most frequently reported body parts of concern were the	Onden-Lim &	stomach most common, skin and weight common, then thighs legs		

stomach (33.8 %), skin (30.7 %), weight (29.2 %), thighs(24.6 %), legs (13.8 %), arms (13.8 %), hair (13.8 %), body proportion/shape (12.3 %), overall appearance of face(10.8 %), and breasts (10.8 %).	Grisham, (2012)	arms hair, body shape face and breasts		
4 (7.2 %) reported images that contained their body ideal	Onden-Lim & Grisham, (2012)	Although uncommon, some imaged their ideal body		
(e.g., "me with larger chest, smaller thighs and stomach fat"),	Onden-Lim & Grisham, (2012)	imagery of ideal chest, thighs and stomach		
Two referred to specific body sensations as well (e.g., my spots popping).	Cooper & Osman, (2007)	some also mentioned body sensations such as spots popping		
For women, typical features of concern were their skin, eyes, hair, teeth, and genitalia.	Cooper & Osman, (2007)	womens areas of concern more skin eyes hair teeth and genitalia		
For the men, eyes, hair, and genitalia were also common concerns, as well as their nose and head size	Cooper & Osman, (2007)	male areas of concern were eyes hair genitalia nose and head size		
Participants in the BDD group were also more conscious of	Cooper & Osman, (2007)	bdd patients more conscious of internal body sensations than controls		

their internal body sensations				
and involved facial and bodily features that took up a greater proportion of the whole image	Cooper & Osman, (2007)	compared to controls, bdd imagery involved a greater proportion of facial and body images in the total image area		
Often it is the participants' favourite features, which are most identified with the self, that are then later viewed as defective:	Silver & Reavey (2010)	often the "favourite features" of the childhood self are the current body areas of concern in bdd		
definitely different to my left eye, and look at my eyes. I started worrying less about my skin, and looking more at my eyes.	Silver & Reavey (2010)	when focusing on feeling one body area of concern is bad, eg their eyes being asymmetrical ,then look at other parts of their face and judge whether they are symmetrical. So the imagery then leads to more generalised negative self perceptions		
percentage occupied by the body/body parts,	Onden-Lim & Grisham, (2012)	no correlation between bdd severity and focus on body / body parts		
'Can he see my face? Is my face being ugly? . . . what my hair's doing, erm . . ., "Why am I bending over like this?" or my fat's like bunching together (	Stechler & Henton, (2022)	during intimacy, imagery of body areas of concern eg seeing own fat rolled up or trying to imagine what hair and face looks like from partners perspective		
described seeing an array of images of the bodies of "beautiful women"	Stechler & Henton, (2022)	one person described during intimacy, seeing intrusive imagery of "beautiful women" like a slideshow in their mind, alongside the disembodied, cut off experience		

The median number of modalities reported for the images/impressions was 2.00	Cooper & Osman, (2007)	on average, imagery happened in 2 sensory modalities for bdd group, and 1 modality for control group		
This difference was significant U = 98.50, p = .04).	Cooper & Osman, (2007)	bdd patients experience imagery in more modalities than non-bdd controls		
The visual modality was the most commonly reported sensory modality for both patients and controls	Cooper & Osman, (2007)	visual modality the most common for imagery		
followed by the organic modality	Cooper & Osman, (2007)	internal/organic modality second most common imagery		
The latter consisted of feelings of anxiety, such as tingling sensations in the body part of concern and a feeling of butterflies in the stomach	Cooper & Osman, (2007)	organic/internal imagery was experienced as anxiety body sensations, like triggering the body areas of concern or butterflies in stomach feeling		
No participants reported gustatory or olfactory sensations.	Cooper & Osman, (2007)	no gustatory or olfactory imagery reported by anyone		
Visual 15 83% 14 100%	Cooper & Osman, (2007)	every bdd early memory was in the visual modality		
Organic internal 13 72%, 12 85%	Cooper & Osman, (2007)	85% of bdd imagery was in the organic internal modality		
Auditory 1 6%, 8 57%	Cooper & Osman, (2007)	57% of bdd imagery had the auditory modality	Modality of imagery	

Kinaesthetic 1 6%, 6 43%	Cooper & Osman, (2007)	43% of bdd imagery involved the kinaesthetic/movement modality		
Cutaneous 1 6%, 5 36%	Cooper & Osman, (2007)	36% of bdd imagery involved tactile / cutaneous modality		
Gustatory 0, Olfactory 0	Cooper & Osman, (2007)	no bdd imagery was in the gustatory or olfactory modality		
reported for the BDD group early memories was 2.50	Cooper & Osman, (2007)	on average, imagery was experienced in 2.5 modalities per time for bdd people		
There was also no correlation between dysmorphic concern and the number of reported imagery modalities	Onden-Lim & Grisham, (2012)	no correlation between number of modalities and bdd severity		
Since few participants reported imagery modalities other than visual	Onden-Lim & Grisham, (2012)	very few people report imagery in a mode other than visual		
and that same feeling it's just always there ready to pounce.	Silver & Reavey (2010)	person implies that more anxiety, more sensory modalities. it is only when they feel strong anxiety about their distorted imagery that they start to feel it in their skin		
the described images by the first author and another independent researcher created an impression of a variety of scenarios	Ghaderi et al., (2022)	participants reported different impressions and perspectives and things within the imagery		
looking critically at one's body in the mirror	Ghaderi et al., (2022)	mirror, body shape		
frequency of mental imagery in general	Ghaderi et al., (2022)	more often imagery not associated with more dissatisfaction	Perspective of imagery	

(i.e., how often they have various mental images in mind) was not related to body dissatisfaction				
However, we found a significant correlation between the frequency of body-related imagery and body dissatisfaction	Ghaderi et al., (2022)	but, body-focused imagery associated with more dissatisfaction		
sizeable negative correlation between positive valence of body-related mental images and body dissatisfaction.	Ghaderi et al., (2022)	People who experience body dissatisfaction still get positive imagery too		
I just couldn't cope with looking in the mirror and seeing the left hand side of my face	Craythorne et al., (2022)	found mirror gazing hard, to be the first noticeable feature of bdd		
When a photo is taken of me I have to spend ages looking at it and it makes me feel disgusting and I feel disgusting now thinking about different photos I've looked at with me in. I look deformed and it makes me worry because I must look that vile in real life	Craythorne et al., (2022)	seeing photos of self seems to trigger imagery of self in real life in critical way		
16 (29.1 %) reported images that contained another person/people	Onden-Lim & Grisham, (2012)	30% of imagery involved another person or people		

Images often contained more than one category (e.g., the current self and another person/other people).	Onden-Lim & Grisham, (2012)	images often involved self, others, and other elements rather than just one singular image		
The remain-ing images containing another person/other people involved positive (17.6 %) or neutral (5.9 %) descriptions, often where the other person/people was judged as very attractive.	Onden-Lim & Grisham, (2012)	some imagery with others in was neutral, but most often involved the other people being very attractive		
The majority of the sample (63.8 %) viewed their images from an overall observer perspective	Onden-Lim & Grisham, (2012)	most imagery was from the observer perspective		
a smaller proportion of participants (27.7 %) viewed their images from an overall field perspective	Onden-Lim & Grisham, (2012)	less, but still about a quarter, of imagery was from the overall field perspective		
and the remaining participants (8.5 %) viewed their images from both perspectives equally.	Onden-Lim & Grisham, (2012)	some people experienced imagery from the observer and the field perspective		
the majority of participants' images appeared in the context of a social comparison/situation	Onden-Lim & Grisham, (2012)	the majority of imagery was in the context of, in real life, experiencing a social comparison		
Focus of Attention in the Image. All patients reported paying most attention to their	Cooper & Osman, (2007)	all 18 participants said imagery focused on their appearance		

appearance in the image				
Eight patients "always" thought that their image/impression was a fact	Cooper & Osman, (2007)	8/18 people felt their imagery/thoughts were an absolute fact		
the remainder of the patients (10) reported that they could "sometimes" see it either as a distortion or "at a distance from what was really happening."	Cooper & Osman, (2007)	10/18 sometimes saw it as a distortion and sometimes as fact, or had some other level of insight into not fully believing the imagery as fact		
and external appearance	Cooper & Osman, (2007)	bdd patients more conscious of their external appearance than controls		
The observer/mirror perspective. The median ratings for perspective of the images/impressions were 3.00 viewing myself completely from an external viewpoint, as if through the eyes of another, IQR = 3.00 to 3.00	Cooper & Osman, (2007)	most bdd people said the image was themselves from a third person perspective, whereas control group said it was themselves from their own eyes		
viewing myself completely from my own eyes, as if in a mirror, IQR = 73.00 to 73.00) for the control group.	Cooper & Osman, (2007)	so bdd more likely to see an external picture of themselves, controls more likely to see just their usual visual of self		
All BDD participants saw themselves from an observer perspective, while all control participants	Cooper & Osman, (2007)	difference between bdd and controls bdd all reported seeing themselves in third person, all controls saw themselves from a mirror perspective		

reported the mirror perspective.				
These memories were also mainly viewed from an observer perspective	Cooper & Osman, (2007)	intrusive memories in bdd mostly observed from a third person perspective		
sensory similarity reported between the spontaneous image/impressions and the associated memories was 60%	Cooper & Osman, (2007)	60% similarity between the imagery and associated memories		
if we are having sex [. . .] I see pictures in my head of like other girls and like just sort of, just sort of start	Stechler & Henton, (2022)	during intercourse, person sees images of other girls and that makes them feel gross about themself		
like a slideshow of bodies, beautiful women that I don't look like.	Stechler & Henton, (2022)	during intimacy, person describes slideshow of other girls they don't look like and feel disgusting and bad		
In participants' narratives, BDD seemed to take on an identity of its own—as though there were three in a relationship	Stechler & Henton, (2022)	during intimacy, bdd acts like a third person in the room, one who is more superior and sabotaging and wants to control or restrict freedom		
BDD was a bully or abuser—one participant suggested that like a bird it "pecks at you" in a way that sounded as if it might feel like a physical pain	Stechler & Henton, (2022)	bdd imagery can feel like the abuser itself, as it judges, has been referred to as like physical pain, and feels like a constant set of "sharp jabs"		
joke. It seemed there might be a link between an inadequate sense of self and	Stechler & Henton, (2022)	link between adequacy as a person and adequacy of the parts of body they dislike, i.e. they are inadequate and therefore they have these flaws		

inadequate parts of their body, which they described in terms such as "awful," (Mia) "giant" (Samantha, Grace) or "rubbish"				
The doubt she dwelled upon regarding whether she has BDD appears to be due to the inseparability of her perceived self and objective self. In other words, her perceived distortions are irrefutable, in that she does not consider them to be distortions.	Craythorne et al., (2022)	indiscrimination between perceived and objective self was a barrier to insight		
One person noted that it triggered flashbacks, another that it was an accurate representation.	Cooper & Osman, (2007)	imagery triggered flashbacks in one person out of 18		
Participants described disgust and a sense of detachment or disembodiment during physically intimate moments with their partners.	Stechler & Henton, (2022)	or trigger, partner described that during moments of intimacy, they experienced detachment or disembodiment from themselves		
adopting a third-person perspective	Stechler & Henton, (2022)	every woman interviewed said they felt they saw themselves from a third person perspective when intimate with a partner		
Their preoccupied thoughts and worries ran-ged over their bodies as a visual stimulus	Stechler & Henton, (2022)	their preoccupation with thoughts and images meant they were less of an active participant in the act of intimacy itself		

The use of the photographs was a powerful way of capturing feelings that could not always be articulated	Silver & Reavey (2010)	using old photographs seems to evoke imagery about emotion and content, and bring out feelings in a way that people find hard to articulate without guidance		
From this initial nightmare of a traumatic skin eruption,	Silver & Reavey (2010)	from one experience of bad imagery about body area of concern, this perception gets distorted over time to more exaggerated and negatively perceived defects		
All the participants reported at least one body-related men-tal image	Ghaderi et al., (2022)	All participants reported at least one experience of body-related imagery		
Fifty-five (84.6 %) participants reported experiencing recur-rent intrusive imagery.	Onden-Lim & Grisham, (2012)	most people, 84.6%, experienced intrusive recurrent imagery		
All of the BDD patients reported experiencing either spontaneous images n = 17, 94%) or other sensory impressions n = 1, 6%) when worried or anxious about their appearance.	Cooper & Osman, (2007)	all bdd patients experienced spontaneous imagery when worried about appearance		
Of the control participants, 15 83%) reported either spontaneous images n = 6, 33%) or sensory impressions n = 9, 50%).	Cooper & Osman, (2007)	in general population/non-bdd controls, 83% experienced spontaneous intrusive imagery or sensory experiences too	Presence of imagery	

There was no difference between the patients and controls in reported frequency of spontaneous images/impressions	Cooper & Osman, (2007)	do significant difference between frequency of imagery, between the bdd patients and the controls		
Of those experiencing spontaneous images/impressions, 17 94%) in the patient group and 746%) in the control group reported these to be recurrent.	Cooper & Osman, (2007)	twice as many bdd patients compared to controls said the imagery was recurrent		
there was no significant correlation found between dysmorphic concern(indexed by BICI) and image frequency	Onden-Lim & Grisham, (2012)	no correlation between bdd concern and frequency of images		
and to put on favorite jeans and feeling how well they fit.	Ghaderi et al., (2022)	ideal of a future with better body		
future nice haircuts and hairstyles	Ghaderi et al., (2022)	future		
being on the move (e.g., on the beach)	Ghaderi et al., (2022)	movement, outside objects		
She experiences a feeling of disgust if she does inspect a photograph of herself, and this disgust is also evoked by memories of her appearance in photographs too, suggesting she may be haunted by residual distortions.	Craythorne et al., (2022)	photos can be reminders of appearance related memories and bring this back	Time location of imagery	

factors included the subject depicted in the images and temporal quality (i.e., past self, present self, future self, ideal self, other).	Onden-Lim & Grisham, (2012)	authors found theme of temporal quality of images, and content of images		
Thirty-four participants (61.8 %) reported images that contained their present self	Onden-Lim & Grisham, (2012)	most imagery was in the present version of self		
(5.5 %) reported images that contained their self in the past (e.g., "I see my body when I was in middle school"),	Onden-Lim & Grisham, (2012)	small percentage of imagery in the past e.g. at school		
2 (3.6 %) reported images of them-selves in the future (e.g., "myself—older and bigger").	Onden-Lim & Grisham, (2012)	some in the future but this even rarer than the past		
Images tended to be viewed as moving films (46.7 %) or still photos (42.2 %),	Onden-Lim & Grisham, (2012)	imagery was moving films or still photos		
with the remaining viewed as a series of different photos or snapshots (11.1 %).	Onden-Lim & Grisham, (2012)	11% were a series of different photos and snapshots		
Inspection of the data suggested that there was generally a close match between reported modalities, i.e., patients who experienced a particular modality in their images/impressions	Cooper & Osman, (2007)	close match between the modalities remembered in the early memory, and those experienced in imagery. ie if it was a visual memory, the visuals are seen in imagery		

were also likely to experience that modality in the associated memory.				
He's a good-looking chap aint he?	Silver & Reavey (2010)	using photograph imagery, people used third person accounts to describe their past self, eg "he is a good looking chap" or "i don't know who that girl is" instead of using the terms "i" and "me"		
future weight loss	Ghaderi et al., (2022)	future		
past experiences of pregnancy,	Ghaderi et al., (2022)	past experience, pregnancy		
The BDD group reported images/impressions that were visually more vivid	Cooper & Osman, (2007)	bdd imagery was significantly more vivid than for the controls		
...more detailed...	Cooper & Osman, (2007)	bdd imagery also had higher detail and visual acuity/sharpness		
The BDD images/impressions also involved organic sensations that were more vivid U = 6.00, p = .002) and intense	Cooper & Osman, (2007)	bdd imagery for organic/internal feeling was also more vivid and intense	Vividness of imagery	

No correlation was found between dysmorphic concern and vividness, perspective or detail (colour, brightness, extent of 3D representation(depth),	Onden-Lim & Grisham, (2012)	no correlation between bdd severity, and vividness perspective or detail about images		
Which despite significant variations were readily divided into a positive or a negative theme.	Ghaderi et al., (2022)	Imagery is positive or negative	Negative emotions	Consequences and maintenance patterns
being mindful of the body (e.g., while walking and sensing the wind),	Ghaderi et al., (2022)	mindful		
sensing freedom and strength	Ghaderi et al., (2022)	freedom and strength		
current negative consequence of past pregnancies on the body,	Ghaderi et al., (2022)	negative past present today		
and a dysfunctional body.	Ghaderi et al., (2022)	negative imagery on body function		
the occurrence of both negative and positive mental images	Ghaderi et al., (2022)	imagery can be positive and negative		
between negative valence of images and body dissatisfaction	Ghaderi et al., (2022)	more body dissatisfaction, more likely to see imagery as negative		
targeting negative body-related mental images	Ghaderi et al., (2022)	should focus on the negative images as these are associated with body dissatisfaction more than imagery in general		

Most images containing another person/other people contained negative descriptions (76.5 %);	Onden-Lim & Grisham, (2012)	imagery involving others was mostly negative		
they involved themes including glooks of disgust form another person/other people, and/or other people talking about or laughing at the individual.	Onden-Lim & Grisham, (2012)	imagery involving others was mostly about the other person/people critiquing and comparing them		
Participants also rated the majority of images (82.5 %) as negative in emotional tone	Onden-Lim & Grisham, (2012)	most imagery was negative in emotional tone		
with some images (14.0 %) rated as positive in emotional tone (i.e. rated their images from +1to +3), and the smallest proportion of images rated as neutral(3.5 %).	Onden-Lim & Grisham, (2012)	about 14% of images were positive		
All reported disadvantages. Thirteen reported that the image made them feel more self-conscious, eight reported that the image made them feel emotionally distressed or depressed, while six reported that it decreased their self-confidence and/or self-esteem.	Cooper & Osman, (2007)	all 18 said that it had disadvantages, stating imagery made them more self-conscious, emotionally distressed, depressed, decreased self-confidence and esteem		

Six reported that it affected their behavior (including ability to go out or get on with life).	Cooper & Osman, (2007)	one third of participants said imagery affected their behaviour broadly, such as inability to get out on get on with life		
One patient noticed that attending to the image distorted it more, another that it increased his or her focus on appearance, and two that it reinforced the negative way they felt about themselves.	Cooper & Osman, (2007)	attention paid to imagery increased the distortion more, increased focus on appearance, and reinforces negative self-perceptions		
five used negative comments and reactions from other people, three used body sensations, three used their own thoughts, two used their appearance, and one used the media.	Cooper & Osman, (2007)	negative judgments also maintained by seeing negative reactions from others, body sensations, own thoughts, and the media		
Four patients reported advantages to their negative thoughts. Three said that it motivated them to change their appearance and one that it prevented him or her from becoming arrogant. All reported disadvantages	Cooper & Osman, (2007)	similar opinion of whether negative thoughts have advantages/disadvantages experiences as with imagery		
Thirteen patients "always" thought that their thought was a fact, while the remainder of the patients (five) reported that they could	Cooper & Osman, (2007)	more people thought negative thoughts were accurate/factual than thought imagery was accurate/factual (8/18 for imagery, 13/18 for thoughts)		

"sometimes" see it either as a distortion or "at a distance from what was really happening".				
Being seen involved at times a sense of unbearable, excruciating exposure.	Stechler & Henton, (2022)	being seen naked/semi-naked by another seen as unbearable and excruciating exposure		
In parallel, this distress seemed to manifest in the way participants recalled their experiences during the interviews	Stechler & Henton, (2022)	describing imagery content in interview brought up intense emotions in the participants		
The participant's concern was that in the shower her partner could "really look" at and see the "real it."	Stechler & Henton, (2022)	participants described worrying that if partners saw their naked body they would see "the real" them		
feel as if my flaws were deformities	Craythorne et al., (2022)	escalation from appearance flaws to deformities		
It made me feel kind of good that other people had it and I started to read about it more and it would always make me feel	Craythorne et al., (2022)	validating but also saddening		
My BDD flares up considerably whenever I am stressed or anxious but even when I am not, it is there with me constantly every day… you asked how often I thought about my body image and I can honestly say that it would be	Craythorne et al., (2022)	bdd related symptoms and imagery worsen when more stressed and anxious		

impossible to say because it feels like the thoughts are there almost all the time. It would be easier to let you know how often I don't think about it. It is quite often my waking thought and I dream about it regularly.				
The majority of images were rated by the participants as negative in emotional tone	Onden-Lim & Grisham, (2012)	the majority of imagery content was negative in emotion		
except for images containing ideal selves, of which the majority were described as having a positive emotional tone.	Onden-Lim & Grisham, (2012)	the majority of imagery about ideal body shape was described as positive imagery		
The remaining images containing the present self(22.6 %) contained neutral content (e.g., "I see myself without a shirt").	Onden-Lim & Grisham, (2012)	some imagery was neutral in content ie not better or worse		
On the other hand, those with images containing a body ideal (100 %) or the self in the past (66.0 %) described the self in desirable or neutral terms	Onden-Lim & Grisham, (2012)	imagery of the past, and of the body ideal, were perceived in good or neutral terms		
All patients reported either a spontaneous image (n = 17) or a	Cooper & Osman, (2007)	all participants experienced intrusive imagery when worried or anxious about appearance		

sensory impression (n = 1) when worried or anxious about their appearance.				
All patients also reported one or more negative thoughts when worried or anxious about their appearance.	Cooper & Osman, (2007)	as well as imagery, all participants experienced negative thoughts when anxious/worried about appearance		
Twelve of the patients had negative thoughts about the image.	Cooper & Osman, (2007)	2 thirds of people had negative thoughts about their imagery		
Ten patients reported paying most attention to their appearance in the thought.	Cooper & Osman, (2007)	negative thoughts also increased attention to self, and to imagery of the self		
Four reported being aware of the "whole thought," while two reported being aware of how they looked in the mirror. One reported most awareness of tension pain.	Cooper & Osman, (2007)	negative thoughts increased some imagery on pain feelings eg tension		
According to questionnaire scores the BDD patients were more depressed BDI-II: U = 8.00, p < .001), had lower self-esteem RSE: U = 4.50, p< .001), and had higher fear of negative evaluation by others FNE: U = 24.00, p < .001) than the control participants	Cooper & Osman, (2007)	bdd patients have more depression, low self-esteem and more negative evaluation fears than controls		

BDD patients' ratings were significantly more negative U = 28.50, p < .001) than the control groups' ratings.	Cooper & Osman, (2007)	imagery has significantly more negative emotional tone for bdd people than controls		
Even though I tried to hide it and act unbothered by them	Craythorne et al., (2022)	person acted unbothered by trauma at the time	Safety-Seeking Behaviours	
But I think it was quite soon after that I tried to dig a mole on my right forearm out with a sharp stone in the playground… I also tried to dig a mole out of the rear of my thigh, but that was not successful.	Craythorne et al., (2022)	self surgery as child to correct the perceived defect		
after the phone call I was staring in the mirror	Craythorne et al., (2022)	checking behaviour immediately after the trauma event		
The longer I looked [in the mirror] the less it made sense what I was looking at	Craythorne et al., (2022)	mirror gazing more distorts perception more		
the features seemed to be much more individual rather than looking at a face as a whole…	Craythorne et al., (2022)	mirror gazing increases focus on specific body areas		
whether image suppression predicted dysmorphic concern after controlling for depression, anxiety, and stress.	Onden-Lim & Grisham, (2012)	imagery suppression significantly associated with bdd, even when controlling for depression, anxiety and stress		

Eleven reported wishing it would go away, that they were fed up with it, or that they told it to go away.	Cooper & Osman, (2007)	11/18 people wished the imagery would go away		
Eleven patients engaged in distraction (cognitive, behavioral, or both) to cope with the negative thoughts they experienced	Cooper & Osman, (2007)	11/18 people used distraction to try and cope with the imagery		
Two went to sleep, three engaged in checking, two avoided situations or activities, three engaged in self-talk (e.g., it isn't true), one covered himself or herself up, and one waited for the thoughts to go away.	Cooper & Osman, (2007)	strategies to distract from imagery included sleeping, checking, avoidance, self-talk, covering self up, waiting for thoughts to go away		
Three either had no coping strategies or simply waited for the image/impression to go away.	Cooper & Osman, (2007)	3 out of 18 had no coping strategies to manage the imagery/thoughts		
Eight wanted to feel better (less anxious, less depressed), six wanted to stop the image or thought from happening, two wanted to check that their looks hadn't changed, two wanted to look better, two wanted to feel reassured, and one wanted to feel less self-conscious.	Cooper & Osman, (2007)	reasons for coping strategies for imagery included wanting to feel better, stop the imagery, check that nothing had changed, feel reassured, and feel less self-conscious		

Three patients reported advantages to this. One patient reported that it motivated them to change their appearance and two that it prevented them from becoming arrogant.	Cooper & Osman, (2007)	3/18 said imagery had benefits, because it either motivated them to change appearance or prevented them from becoming arrogant		
Role of Memory to Deal With Image. Seven patients used their memory to try to deal with the situation in their image/impression. Most thought of past positive experiences that they had had, while one person tried to think of people who were worse off than himself or herself.	Cooper & Osman, (2007)	participants used memories to deal with the image in their head, eg think of past experiences or think of people worse off than themselves		
Twelve of the patients had negative thoughts about the thought. Five reported wishing it would go away, that they were fed up with it, or that they told it to go away.	Cooper & Osman, (2007)	negative thoughts were coped with in a similar manner to imagery, although there was more challenging/rationalising/bargaining with thoughts than for imagery		
.I was twisting my face, it was uncomfortable, then it was like that actually sort of twisted it in my mind	Silver & Reavey (2010)	one person describes almost an active process of distorting their image in their mind to make it worse as it made them feel better to see themselves as distorted as it represented their negative self-perceptions		

I can feel the lumps, never, yeh, never ever forgotten that moment, and that anxiety,	Silver & Reavey (2010)	and then as the imagery gets more distorted, that increases their anxiety as the image is so strongly related to their self-perception		
look young for your age, but your eyes are, you can tell your eyes aren't like proper 19-year-olds.' And then I started looking at my eyes, but, I started looking at, more so, I started staring at My eyes,	Silver & Reavey (2010)	memory of people saying appearance related thing about the face, led to more mirror gazing focusing on that part of the face, which then led to more imagery and distorted perception as focused on it more		
shielding them also from the unpleasant reality of their perceived flaws.	Stechler & Henton, (2022)	camouflaging body from partner also felt like it had the effect of protecting themselves and their partner from their perceived flaws		
Without make-up, there seemed to be a further sense of shame or embarrassment, and hands become like the wardrobe door:	Stechler & Henton, (2022)	implied that if not doing camouflaging behaviours like hiding and make-up, the increased shame and embarrassment from feeling exposed evoked more vivid and powerful imagery		
some participants were tearful, others seemed to hold a tense or hunched posture	Stechler & Henton, (2022)	some people hunched over, cried, looked down, asked for a break, when recalling the imagery they experience when intimate with their partner		
All participants attempted to control and manoeuvre their partner's gaze as a means of managing their	Stechler & Henton, (2022)	people's safety seeking strategies as a result of feeling partner sees them, is to try and control and maneuverer their partners gaze, eg by positioning themselves or using angles to try and manipulate what their partner could see		
(with laughter, repetition, pauses, turning away) was felt to be indicative of the	Stechler & Henton, (2022)	during interview recalling intimate times with partners, participants noted to do the same controlling maneuverers in interview eg		

importance of these man-oeuvres for them,		laughter, pausing, turning away, which was felt to be indicative of how emotion evoked by recalling the experiences		
rather it was a numb experience, disengaged from their bodily senses.	Stechler & Henton, (2022)	during sex, bbd people said felt numbs and disengaged from sense, wanting it to be over		
We found a significant positive association between dysmorphic concern and image suppression	Onden-Lim & Grisham, (2012)	bdd concern correlated strongly with attempts to suppress imagery		
In contrast, another participant suggested that the longevity of her relationship and the fact she had habituated her partner to all her "flaws" made the	Stechler & Henton, (2022)	in contrast, someone said they felt partner seeing them felt more comfortable than a stranger because they felt partner had habituated to their flaws	Impact on relationships	
worrying in some way what I appear like or what I'm doing or what he's seeing or what he's looking at	Stechler & Henton, (2022)	the detachment leading to them less present in the intimacy, led people to worrying that they weren't good at intimacy or that they were being judged by their partner for not being good at intimacy		
Making negative comparisons between her own body and the moving sequence of images of other girls in her mind was so upsetting that she was frequently unable to continue	Stechler & Henton, (2022)	one person described imagery as so upsetting they had to stop the act of intimacy		
Sex was described as a mundane obligation	Stechler & Henton, (2022)	sex felt like a mundane obligation due to the negative experiences related to bdd it evoked		

I didn't really know whether [sic] I actually had it or whether [sic] I was being a hypochondriac but I must have it or I'm really hideous and I'm using it as an excuse for my horrible face	Craythorne et al., (2022)	confusion in bdd symptoms, not knowing if have bdd or if perceptions are true. sounds insight related	Self-worth	
This fragmentation is a great source of frustration and sadness for some participants.	Silver & Reavey (2010)	bdd people therefore seem to have a fragmentation between their past and former self, with idealisations about the past, that add to present day sadness and frustrations about their image and self		
BDD patients were happy with their appearance, when participants were asked how they would ideally like to look, their response indicated that they wanted to look like their actual self without the 'defects.'	Silver & Reavey (2010)	in general, bdd people's ideal self is just their actual self but without their perceived defects. ie not a completely different self. places centrality on the perceived defect as the cause of all their problems		
the unique factor seemed to be the level of distress that accompanied these experiences	Stechler & Henton, (2022)	appeared that although feeling body conscious is a normal concept, it is the level of distress that accompanied this that seemed unique in those with bdd		
and the way these experiences formed part of a wider set of distressing phenomena.	Stechler & Henton, (2022)	and also, the way experience of body consciousness evoked a complex set of other distressing phenomena associated with self-judgment, self-concept, shame, etc		
in the process of preparing themselves to go out or where they	Onden-Lim &	imagery occurred when people were preparing themselves to go out or before seeing others	Cultural and Societal Influences	Causes

anticipated social contact	Grisham, (2012)			
many participants stated that a perfect image would mean improved self-worth.	Silver & Reavey (2010)	many people referred to an idea that a perfect body image represents perfect self-worth. therefore in bdd seems a tight link between image and self-worth		
Peter, who attempts to modify his appearance by morphing pictures of himself on digital cameras comments that:	Silver & Reavey (2010)	due to body image representing self-worth, for some people it seems actively distorting their self-image reflects their negative view of their self		
My mum's side of the family, they tend to be, they are quite vain	Silver & Reavey (2010)	one bdd person described their family as very vain people, leading to them feeling they had a lot to live up to with regards to appearance		
construction of the self. Louise feels that within the Indian culture women are very much judged on their looks and are expected to be beautiful aesthetic objects to be gazed at both by other men and by other women:	Silver & Reavey (2010)	Indian culture, women expected to be aesthetic objects so self-image is important. therefore, culture seemed important on how bdd develops		
Around half the participants suggested there was a difference between the gaze of a stranger and their partner's gaze.	Stechler & Henton, (2022)	people felt their partners gaze was different to that of a stranger, and more connected to their emotional perceptions of self as well as physical	Judgment and Criticism	
'Oh, he's . . . ' I'm more critical of myself (Victoria)	Stechler & Henton, (2022)	participants described feeling their partner were more critical of their body than a stranger would be, because the person is more critical		

		of themselves than a stranger would be		
uncomfortable and exposing—embodying an objectified sense of self as "deformed	Stechler & Henton, (2022)	being intimate with partner felt exposing, which triggered feeling objectified, which triggered feeling deformed/fat/gross, and then getting self-conscious during intimacy		
participants again seemed to dis-connect from identifying their body as their own,	Stechler & Henton, (2022)	in intimate moments, participants described not seeing their body as their own, feeling detached from themselves		
by a cognitive focus on the appearance of their body and highly negative appraisals of its appearance.	Stechler & Henton, (2022)	as well as feeling detached from their own body, also felt highly conscious of body appearance and highly negatively critical of it		
"I'm just outside watching":	Stechler & Henton, (2022)	one person described "watching from the outside" during intimacy, like it triggers an out of body experience due to the associated feeling of detachment		
Detaching from their bodies seemed to shield them and help them escape from a potentially threatening situation:	Stechler & Henton, (2022)	seemed detaching from their body was a way to shield themselves from the threatening situation they perceived from threat of judgment		
this participant was also led to question herself,	Stechler & Henton, (2022)	experienced judgmental imagery leads person to question themselves and their abilities		
How is he finding . . . that bit of my body sexy?' Like when he touches my bum, I'm like, 'Seriously, it's giant [. . .] "	Stechler & Henton, (2022)	mental mind reading during se "what is he thinking, what can he see, does he like this"		

The amount of criticisms she received may have contributed to her feeling overwhelmed by the negative perceptions other people had ascribed to her body	Craythorne et al., (2022)	lots of criticism makes it overwhelming		
you have lots of beauty spots' in a pleasant way referring to facial moles I had/have… [the boy], who also had facial moles, said something like 'they're not beauty spots, they're moles' in a very harsh and disparaging way… I don't recall openly reacting in any specific way.	Craythorne et al., (2022)	at time, took in content and judged the negative over the positive content as true		
I was so much like my auntie [name redacted]'who was viewed very negatively by the family	Craythorne et al., (2022)	overt social comparison to others viewed negatively		
By describing her face as "horrible," she attaches her distorted perception to her objective appearance, reinforcing their inseparability	Craythorne et al., (2022)	distorted perceptions maintained in description of self as horrible		
participants with images containing the self in the present (77.4 %) and future (100 %) typically	Onden-Lim & Grisham, (2012)	present and future imagery was usually undesirable, eg being fat or frustrated		

described the self in undesirable terms				
in having verbal thoughts about weight or general appearance.	Onden-Lim & Grisham, (2012)	when ruminating on verbal thoughts about weight and appearance		
Two wanted to distract themselves, one wanted to get away from negative judgments, and one wanted to achieve his or her potential in life.	Cooper & Osman, (2007)	also some wanted to distract self or get away from negative judgments, by trying to cope with the imagery		
All patients formed judgments about themselves as a result of having the image/impression.	Cooper & Osman, (2007)	all participants had a negative judgment about themselves due to having the imagery		
Eleven thought that they were unattractive, six that they were ugly, and five that they were inferior or worthless, and three described themselves as a freak.	Cooper & Osman, (2007)	due to having imagery, participants felt they were unattractive, ugly, inferior, worthless or a freak		
Eleven patients looked in a mirror to help them form their negative self-judgments	Cooper & Osman, (2007)	most people used mirror gazing to further evidence the negative judgments that the imagery generated in them		
unable to come to terms with the idea that they were no longer the child they were	Silver & Reavey (2010)	notion that in bdd, people unable to come to terms with idea they are not the child they once were		
free of not only blemishes and impurities, but free from the	Silver & Reavey (2010)	compared to now, bdd people may find it hard that they used to be blemish/impurity free and free of responsibility		

responsibilities of their adult self.				
to current perceptions of ugliness or defects may overlook the link between past and current versions of selfhood	Silver & Reavey (2010)	emotional tone negative due to comparison between perceived self today and idealisation of the past self which is perceived more attractive version of themself		
referring to a 'real' reflection of their lost youth, but a presently constructed idealised fiction of the past.	Silver & Reavey (2010)	comparison between current and former self more of an idealised fiction of the past rather than a real reflection		
it is argued that references to an idealised past self are a way of explaining and justifying their dissatisfaction related to their present image.	Silver & Reavey (2010)	the idealised past self also explains and justifies dissatisfaction with present self image		
Where they were either not concerned about or were proud of their looks.	Silver & Reavey (2010)	also relate idea that felt happier as children because were not preoccupied with their looks		
There is a radical discontinuity of the self over time. The younger, attractive self is constructed as being completely dissimilar from the older	Silver & Reavey (2010)	"radical discontinuity" - young self perceived as good and attractive, current self old and ugly and referenced in the third person		
as they were envious of the younger self	Silver & Reavey (2010)	envy towards younger self often expressed		
The narrative starts by Susan recollecting that she was an archetypal teenager with bad skin	Silver & Reavey (2010)	negative perceptions of former self often expressed in a stereotypical way, eg one person describing an archetypal spotty teenager when		

		describing their former appearance flaws		
kids in the family, how good looking they all are, and how we	Silver & Reavey (2010)	person remembers at family events, other family would ask how the children are doing and how good looking they are, therefore internalised appearance as an important part of self worth		
suggesting a feeling of shame in connection to their bodies	Stechler & Henton, (2022)	participants had a lot of shame around their bodies		
Through their partner's viewing their bodies were objectified("it") in the spatial and visual field.	Stechler & Henton, (2022)	seeing their partners view their bodies felt like an objectification of them self and triggered them to view themselves from the third person		
Participants' own judgement of their bodies seemed to find itself within their partners' imagined viewpoint or appraisal;	Stechler & Henton, (2022)	their imagery about their partners perceived appraisal from a third person view seemed to also capture the persons own negative views about themselves, ie they assume partners also see the flaws they see in self		
All but one participant spoke about the ways they prevented themselves from being seen naked or undressing by their partner, in order to protect ("shelter" Samantha) themselves from the judgement or shame they might experience under the observation of their partner.	Stechler & Henton, (2022)	safety seeking behaviours around hiding and camouflage reflect wanting to mask judgment and shame they feel about themselves		

I don't want him to see it	Stechler & Henton, (2022)	people referred to their bodies as external to themselves, eg words like "i don't want him to see it (their body)", rather than "i don't want them to see me/my body"		
Some participants referred to sex as "performance"(Grace, Mia) influenced by internalized messages about how sex should be with a pressure to have an orgasm the marker of successful sex.	Stechler & Henton, (2022)	cultural aspect of sex feeling like a performance to please the other person, contributed to why it felt so judgmental and so much criticism		
what if he saw me for who I, how I really was, like . . .what if one day he just woke up and seeing all the flaws that I saw (Lucy)	Stechler & Henton, (2022)	imagery around sexual intimacy led to worrying about the relationship "what if he woke up one day and saw my flaws and left me"		
which caused great distress to a number of participants in the study	Craythorne et al., (2022)	bullying and distress historically is still distressing in present	Traumatic Memories and Early Experiences	
The criticisms were often made by peers, friends and family members,	Craythorne et al., (2022)	criticism from peers, friends and family		
Criticisms were often extensive and were not limited to one aspect of the participants' appearance.	Craythorne et al., (2022)	bullying was not just appearance related		
. I was literally verbally "attacked" from head to toe;	Craythorne et al., (2022)	bullying about appearance felt like being attacked		

my hair, my nose, my moles, my body hair, my weight and size, my "lack of curves"…	Craythorne et al., (2022)	can quote and list bullying criticism in detail		
these comments cut me to the core and I stored them deep within the corners of my brain,	Craythorne et al., (2022)	bullying was remembered and very painful		
ruminating on them even to this day	Craythorne et al., (2022)	bullying from past still ruminated on today		
By using evocative words such as "insults," "ridicule" and "attacked," Angelina helps us to realise how adverse these incidents of bullying were for her.	Craythorne et al., (2022)	use of attacking language shows the harm caused		
Well I've-I've-I've been bullied since I was in year three up until year eleven [aged approximately 7-16 years]…	Craythorne et al., (2022)	bullying was for many years, nearly 10 years		
… I had people anonymously messaging me	Craythorne et al., (2022)	anonymous bullying too		
that I look like a dog… saying that I'm ugly	Craythorne et al., (2022)	appearance comparison in bullying		
I felt hurt that people would actually say it… but at the same time I was like 'yeah you're right'… 'yeah I know I'm that – I just wish I wasn't'	Craythorne et al., (2022)	would believe the bullying content as true		

– I just wish I wasn't'	Craythorne et al., (2022)	internalise content of bullying despite not liking it		
When I was at school, aged approximately seven,	Craythorne et al., (2022)	bullying starting at school age		
I was sitting at a table with another boy… and two girls… one of the girls said something like	Craythorne et al., (2022)	person able to recount and recall the bullying event vividly, as if imagining		
I do remember in detail	Craythorne et al., (2022)	vivid memory of the bullying		
that he found my sister attractive and I tried (very poorly on reflection) to flirt with him by stating that 'I am always told that we both lookalike so that must mean that I am attractive to [sic]?'…	Craythorne et al., (2022)	from someone found attractive. appearance comparison to sister		
I distinctly remember the pause, the awkward laugh and the comment 'No, not really'… it is vivid in my mind during and after the phone call I was staring in the mirror	Craythorne et al., (2022)	use of words vivid and distinctly remember, about the impactful memory		
remember feeling quite um crushed and almost erm taken aback really a bit in shock… it felt like the bottom of my stomach had fallen out	Craythorne et al., (2022)	vivid emotional imagery of trauma		

During the period between the age of 12-16 I remember being rejected by a few boys and I do think that was a contributing factor.	Craythorne et al., (2022)	rejection from people they feel are attractive		
Overall, I was heavily comparing myself to others and idolising girls who were slim and pretty.	Craythorne et al., (2022)	self-criticism and comparison to others perceived as more attractive		
My dad would get short tempered with me and tell me off,	Craythorne et al., (2022)	parent short tempered		
I just have a sense of not feeling good enough in his eyes so whatever was said created that belief in me	Craythorne et al., (2022)	sense of 'not good enough' from non-aesthetic history, ie being seen as unimportant by father		
He once hit me (slapped across my face leaving a hand print) because I did something wrong and I remember the moment clearly, although I have no idea what I did wrong	Craythorne et al., (2022)	remember the bad thing but not the cause of it		
I also got told repeatedly when I was naughty or annoying that 'I was so much like my auntie	Craythorne et al., (2022)	received a lot of critical remarks, not appearance related, growing up		
She [Rohit's mother] had an abusive nature, was harshly critical and discouraging towards me. She would keep pointing out	Craythorne et al., (2022)	critical parent, non aesthetic reasons		

mistakes and negatives in me and everything I did.				
I do not remember being appreciated or encouraged for anything by her.	Craythorne et al., (2022)	no memories of being appreciated by caregiver		
I remember getting shamed often, in comparison to other kids of my age, my cousins and friends	Craythorne et al., (2022)	negative comparison to others of same age		
made, even simple things like buying the wrong vegetables from the shop	Craythorne et al., (2022)	critiqued for even simple thing		
vulnerable to developing a poor relationship with his own sense of self during his formative years	Craythorne et al., (2022)	vulnerability to poor sense of self and relationship with self		
I think I found an article about it [BDD] once and it sounded like me or something like that happened I'm not sure	Craythorne et al., (2022)	saw online content about bdd and related with it		
Of the 18 BDD patients who reported spontaneous images/impressions, 15 88%) reported that they were associated with a particular stressful memory.	Cooper & Osman, (2007)	almost all bdd, 88%, said their imagery was associated with a particular stressful memory		
memory was 11.50	Cooper & Osman, (2007)	age they were at time of memory associated with imagery was 11 and a half		

Typical themes included: being teased and bullied at school	Cooper & Osman, (2007)	associated memories are around being bullied/teased at school		
I was 10years old and never got on with this boy in school	Cooper & Osman, (2007)	person describes imagery memory being from age 10, about another child calling them ugly		
why he didn't like me and he said `it's because you're ugly'."	Cooper & Osman, (2007)	person remembers someone saying they didn't like them because they were ugly, at age 10		
about appearance changes during adolescence e.g.	Cooper & Osman, (2007)	trauma associated to body image led to appearance related self-consciousness during adolescent appearance changes		
My whole face and body seemed out of proportion	Cooper & Osman, (2007)	memory, person remembers feeling different to others due to being tall, "out of proportion"		
all the early memories could be placed in one or both) of these two categories.	Cooper & Osman, (2007)	study suggests all early memories are either about bullying in childhood, or self-consciousness about changes in appearance in adolescence		
Of the 15 control participants who reported spontaneous images/impressions, only 2 (13%) reported these to be closely linked to a particular memory	Cooper & Osman, (2007)	only 13% of controls without bdd said their imagery was related to a specific memory		
The median age in which the memory occurred was 13.00	Cooper & Osman, (2007)	age of associated memory slightly higher for controls, at age 13		
One patient did not wish to discuss their memory.	Cooper & Osman, (2007)	for one person, the associated bdd memory was so intense they declined to describe it in the study		
A total of 11 BDD participants 61%) and 2control participants	Cooper & Osman, (2007)	61% of bdd vs 11% of controls had automatic thoughts (not imagery)		

11%) reported early memories associated with thoughts. T		associated with their early memories		
Most participants who brought in photographs of themselves as young children	Silver & Reavey (2010)	participants able to use past photographs of themselves to create imagery and emotional tone of self compared to past self		
young children constructed the younger self in an exceptionally positive way and remembered childhood as a happy time	Silver & Reavey (2010)	almost all people who related their childhood said they were more positive and happy compared to now		
However, the use of spot cream and its extreme effects on her skin seem to change her self-perception in a very dramatic manner	Silver & Reavey (2010)	participants could vividly describe the emotional relief brought on by early experiences of hiding, eg using spot cream or make up		
from human to monster (from typical teenager to outrageous ogre),which serves to distance herself from someone who is 'normal' and thus emphasises her anxieties and perceived defects.	Silver & Reavey (2010)	suggested that the distortion people do in their appearance imagery related to distancing perception of self from normality to their perceived defects generally as a person		
not really being… having the resources to deal with it – it wasn't like – you know – any-it wasn't- I don't recall it being anything specific	Craythorne et al., (2022)	vulnerability to bdd worsened by lack of resources to manage it at onset		

The mean age of onset of BDD was 14.50 years SD = 7.68)	Cooper & Osman, (2007)	bdd onset in adolescence		

Service Improvement Project Appendices

Appendix E: Author guidance for International Journal of Eating Disorders, retrieved from https://onlinelibrary.wiley.com/page/journal/1098108x/homepage/forauthors.html on April 6 2025

1. SUBMISSION AND PEER REVIEW PROCESS

Once the submission materials have been prepared in accordance with the Author Guidelines, manuscripts should be submitted online at: https://wiley.atyponrex.com/journal/EAT.

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- An ORCID, freely available at https://orcid.org. Please refer to Wiley's resources on ORCID.

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- Because the measurable impact of an article is diminished when citations are split between the preprint and the published article, authors are required to:
- Update the entry on the preprint server so that it links to and cites the DOI for the published version; and
- cite only the published article themselves.

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Recognizing the importance of research transparency and the sharing of data, materials, and code to cumulative research, the IJED encourages but does not require the following Open Science practices.

Registered Reports. For the foreseeable future, the IJED will no longer consider nor publish Stage 1 Registered Reports. Our commitment to In-Principle-Acceptance decisions made on Stage 1 Registered Reports will still be honored and their Stage 2 counterparts will be

published. See the Registered Reports Stage 2 Author Guidelines for details and Stage 2 checklists.

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Authorship

All listed authors should have contributed to the manuscript substantially and have agreed to the final submitted version. Review editorial standards and scroll down for a description of authorship criteria.

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DETAILED MANUSCRIPT PREPARATION GUIDANCE

NOTE: In order to process submissions efficiently, authors are advised to submit with their institutional email addresses where applicable.

Title Page

The Title Page of the manuscript should comprise:

- A brief informative title containing the major keywords. The title should not contain abbreviations (see Wiley's best practice SEO tips).
- All co-author details, including affiliation and email address, and ORCID identifier where possible.
- Up to ten keywords.
- If published already as a preprint, a link to the preprint server.
- An author contributions statement that succinctly indicates how each author contributed to the piece of work, using the CRediT "Contributor Roles Taxonomy". Author contributions are also required within the submission form of both original and revised submissions.
- Any applicable statements relating to our ethics and integrity policies, such as:
    - data, materials and code availability statement
    - funding statement or other acknowledgements of support
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This journal requires details of all authors' contributions to the work by filling out CRediT (Contribution Roles Taxonomy) information during [submission/revision].

This information provided will be used to automatically generate an author contribution statement that will be published with the final article.

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Abstract

The Abstract provides a succinct summary of the article content. The recommended format and word limit vary by article type.

Structured abstracts have a recommended maximum of 250 words and should be organized into: **Objective**: state the primary purpose of the article, or major question addressed in the study. **Method**: indicate the sources of data, give brief overview of methodology, or, if it is a review article, how the literature was searched and articles were selected for discussion. For research-based articles, briefly note study design, how participants were selected, and major study measures. If your data are based on a preregistered study, provide the preregistration number or link. **Results**: summarize the key findings. **Discussion**: indicate main clinical, theoretical, or research applications/implications.

Main Text File

The main text file should be in MS Word and include the following content and recommended formatting:

- Main body, formatted as Introduction, Method, Results, and Discussion, asrecommended by the International Committee of Medical Journal Editors (ICMJE) (**J. Pharmacol. Pharmacother. 2010, 1, 42–58**). Exceptions to these formatting recommendations include Commentaries, Forum articles, and Perspective articles.
- A Public Significance statement (< 70 words) that explains why this research is important and is written in plain English for a general, educated public.
- Figure titles should be supplied as a complete list in the text.

LaTeX Guidelines for Submission:

For authors requiring a LaTeX template, we strongly recommend reviewing Wiley's New Journal Design (NJD) LaTeX Authoring Template.

References

Please refer to article types regarding the number of permissible references.

This journal offers Free Format submission and authors may submit using their preferred referencing style, as long as consistency is applied throughout the manuscript.

The typesetter will apply the American Psychological Association reference style on manuscripts accepted for publication. If authors wish, they may review reference style guidelines prior to submission.

Tables

Tables should include a descriptive title and, if needed, footnotes defining abbreviations and any other information critical to interpreting the data shown.

Figures

Figures should have legends (and if needed, notes) that succinctly describe the information being displayed. Figures should be uploaded in the highest resolution possible.

Supporting Information

Supporting Information is information that is supplementary and not essential to the article but provides greater depth and background. Examples include more detailed descriptions of therapeutic protocols, results related to exploratory or post-hoc analyses, and elements otherwise not suitable for inclusion in the main article, such as video clips, large sections of tabular data, program code, or large graphical files. It is *not* appropriate to include in the Supporting Information any text that would normally go into a Discussion section; all discussion-related material should be presented in the main article.

Authors should mention the Supporting Information in the text of the main article to provide context for the reader and highlight where and how the supplemental material contributes to the article. View Wiley's FAQs on Supporting Information.

Supporting (supplemental) information should be submitted in separate files.

If accepted for publication, Supporting Information is hosted online together with the article and appears without editing or typesetting.

Note: Authors are encouraged to utilize publicly available data repository for data, scripts, or other artefacts used to generate the analyses presented in the paper; in such cases, authors should include a reference to the location of the material in the Method section (rather than in Supporting Information).

Additional Guidance Regarding Manuscript Preparation

The IJED reaches a global audience. Authors are encouraged to consider the implications of their research for populations, settings, or policies beyond those applicable to their own local circumstances.

For studies involving human participants, to aid comprehensive and consistent reporting across regions/countries and cultures, the IJED provides **Demographic Characteristics Reporting Guidelines**.

Authors for whom English is not their first language are encouraged to seek assistance from a native or fluent English speaker to proofread the manuscript prior to submission.

Footnotes to the text are not allowed and any such material should be incorporated into the text as parenthetical matter.

Terminology. Authors should refrain from using terms that are stigmatizing, discriminatory, or ambiguous. The journal rejects stand-alone nouns that refer to individuals by their diagnosis or condition (e.g., “anorexics," “obese,” “diabetics," etc.), race and ethnicity identification (e.g., “Whites,” “Hispanics,” etc.), or presumed disadvantaged status (“minorities”). “Participants” should be used in place of “subjects.” For further explanation and examples, see "*Speaking of that: Terms to avoid or reconsider in the eating disorders field*" (DOI: 10.1002/eat.22528.)

Abbreviations: Only abbreviate terms if they are used repeatedly and the abbreviation is helpful to the reader. Initially, use the word in full, followed by the abbreviation in parentheses. Thereafter, use the abbreviation only.

Units of measurement: Please use the International System of Units. Access www.bipm.fr for more information.

Numbers under 10 should be spelt out, except for: measurements with a unit (8 mmol/L); age (6 weeks old), or lists with other numbers (11 dogs, 9 cats, 4 gerbils).

Trade Names: Chemical substances or drugs should be referred to by the generic name only, not by trade names. For proprietary drugs, the proprietary name and the name and location of the manufacturer should be added in parentheses.

Guidelines on Publishing and Research Ethics in Journal Articles

This journal follows the core practices of the **Committee on Publication Ethics (COPE)** and handles cases of research and publication misconduct accordingly (**https://publicationethics.org/core-practices**). See also **Wiley’s Top 10 Publishing Ethics Tips for Authors** and **Wiley’s Publication Ethics Guidelines**.

The journal requires authors to include in the Method section information on IRB approvals, ethical treatment of human and animal research participants, and gathering of informed consent, as appropriate. Please review Wiley’s policies surrounding **human studies, animal studies, clinical trial registration, biosecurity, and research reporting guidelines**.

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The existence of a conflict of interest by an author does not preclude publication. It is the responsibility of the corresponding author to review this policy with all authors and collectively to disclose with the submission ALL pertinent commercial and other

relationships. If the authors have no conflict(s) of interest to declare, they must also state this.

This journal uses iThenticate's CrossCheck software to detect instances of overlapping and similar text in submitted manuscripts.

RESEARCH REPORTING GUIDELINES

Accurate and complete reporting enables readers to fully appraise research, replicate it, and use it.

At the time of submission, authors will be prompted to confirm whether they have completed a checklist that is specific to each of IJED's article types and designed to aid authors in ensuring that their article includes required and recommended information about study methods and procedures.

For studies and reviews/meta-analyses involving human participants, the IJED has adopted **Demographic Characteristics Reporting Guidelines** that are based on guidelines adopted by the JAMA Network journals, Updated Guidance on the Reporting of Race and Ethnicity in Medical and Science Journals, and work by Buchanan et al., 2021, Upending Racism in Psychological Science: Strategies to Change How Our Science is Conducted, Reported, Reviewed & Disseminated, and, with a focus specifically on eating disorders research, by Egbert et al., 2022 Reporting racial and ethnic diversity in eating disorder research over the past 20 years.

If the study sample lacks diversity in demographic characteristics, particularly with populations typically underrepresented in eating disorders research (e.g., male participants, minoritized populations, etc.), this should be explained (unless self-evident, e.g., a study of obstetric complication in patients with eating disorders would not include male participants) and noted as a study limitation and an area for future research.

Authors should apply study relevant research reporting standards. A list of the most well-known guidelines is given here:

- Consolidated Standards of Reporting Trials (CONSORT)
- Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT)
- Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)
- PRISMA Protocols (PRISMA-P)
- STrengthening the Reporting of OBservational studies in Epidemiology (STROBE)
- Consolidated criteria for reporting qualitative research (COREQ)
- STARD 2015: An Updated List of Essential Items for Reporting Diagnostic Accuracy Studies

- TRIPOD: Transparent Reporting of a multivariable prediction model for Individual Prognosis Or Diagnosis
- Consolidated Health Economic Evaluation Reporting Standards (CHEERS)
- The EQUATOR Network: an author's one-stop-shop for writing and publishing high-impact health research
- FORCE11: Recommended reporting guidelines for life science resources
- ARRIVE (Animal Research: Reporting of In Vivo Experiments) guidelines
- Guidance for the Description of Animal Research in Scientific Publications
- The Gold Standard Publication Checklist
- Updated Guidance on the Reporting of Race and Ethnicity in Medical and Science Journals

Cross-Cultural Studies

If the work involves cross-cultural assessment or assessment in a new language or study population, authors should provide information about local literacy in the language of assessment, the validity of (or process for validating) a translation of an assessment. For inclusion of regional samples, a statement about the sample's representativeness of or distinction from the national sample is required.

Genetic Studies

For association studies, the IJED employs Methods guidelines published by the *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*. These guidelines recommend: minimum sample sizes; for positive findings, an adequately powered independent replication sample; adjustments for multiple comparisons; and reporting of effect size estimates. For more information, see **Author Guidelines**.

When referring to genetic material, the names of genes should be spelled out in full the first time they appear in the text, after which an italicized abbreviation can be substituted. Sequence variants should be described in the text and tables, using both DNA and designations whenever appropriate. Sequence variant nomenclature must follow the current Human Genome Variation Society (HGVS) guidelines (see **varnomen.hgvs.org**).

Intervention Studies

When submitting an intervention study manuscript, authors will be prompted to select whether the manuscript describes a) an Innovation or Implementation study; or b) a Comparative Treatment or Prevention Intervention trial.

In all cases, preregistration is encouraged but, unless otherwise noted, not required. Any presentation of post-hoc findings needs to be clearly justified and contextualized. The inclusion of qualitative feedback on the experience of patients and clients is encouraged.

Feasibility and Pilot Studies

Papers in this category demonstrate the potential of new interventions in the treatment for eating disorders. If randomization is not present, studies should meet the Template Intervention Description and Replication Checklist (TIDieR) standards. When randomization exists, studies should meet the CONSORT extension for randomization and feasibility studies.

Both feasibility and pilot studies describe studies undertaken in preparation for an RCT evaluating the effect of an intervention or therapy. Feasibility studies address whether the future trial can be done, should be done, and, if so, how, while pilot studies (that may or may not be randomized) can include feasibility and inform a future definitive RCT by analysing quantitative data. Feasibility and pilot studies can be combined into one submission, but both functions should be addressed adequately in that paper, with feasibility forming the primary aim. This requires a focus on information that addresses hypotheses about recruitment, acceptability, attrition, cost, accessibility, e.g., Can you recruit as many participants in the time allowed as your study proposes? Will the participants accept randomization? Will they comply with treatment protocols? Is the protocol for delivery of treatment well and clearly enough defined to promote fidelity? Will the participants accept the testing procedures? Can the testing procedures be completed in the time allowed? If these data are included in any subsequent study (e.g., an RCT), that fact should be explained transparently.

These can include single case experimental designs, where one or more cases are presented using visual or statistical methods to demonstrate the clinical impact of an intervention, based on at least an A-B design and session-by-session data. Such case reports should have heuristic value, and so need to be innovative and leading to stronger research. Such cases require a clear statement from the authors that the patient (or the patient's legal guardian) has given permission to publish the material anonymously. Case reports without such clinical outcome data and structured presentation of findings will not normally be considered.

It can also include innovative uncontrolled trials, using a case series to demonstrate the initial implementation of interventions, under uncontrolled conditions (e.g., a series of patients treated with a new therapy; a comparison of therapies for similar but not identical patients). Such case series should be placed in context (e.g., were the patients recruited as a true series, or were they selected from the available pool?) and supported with a CONSORT diagram or the appropriate procedural detail. Preregistration is encouraged but not required.

Finally, it can also include RCTs that are not designed to be adequately powered. Given the smaller numbers typically involved, we require that p values are not reported but rather an estimated between group effect size and its precision (such as 95% confidence interval). As outlined in "The role and interpretation of pilot studies in clinical research" by Leon, Davis

and Kraemer (2011), generated effect sizes should not be used for power calculations for future RCTs as such estimates with small samples can be misleading.

Effectiveness Trials

This category requires evidence that an intervention has been compared to either a control or active condition and has been conducted and reported appropriately in conformity to the appropriate CONSORT checklist (**http://www.consort-statement.org**), particularly randomization of participants. This can include efficacy studies in highly controlled settings and effectiveness demonstrating the rolling out of evidence from controlled trials to routine practice, other populations, etc. Differences relative to the original intervention should be outlined.

Pre-registration before enrollment of study participants is expected to ensure that the core aims and hypotheses are openly addressed. Exceptions may be made for cause upon request prior to manuscript submission. The preregistration number should be entered in the manuscript submission form and also be reported in the Method section. Examples of repositories include https://cos.io/prereg, https://www.clinicaltrials.gov, etc.

Studies attempting to replicate and extend prior findings are important and welcomed, whether or not they support the findings of prior studies.

Proof of concept and pilot studies are not required before an RCT can be published. However, such studies are accepted by IJED, as they form key steps in the development of ideas, grant proposals, etc. Proof of concept and pilot studies can be combined into one submission, but both functions should be addressed adequately in that paper, in such a case. The study description should conform to the CONSORT 2010 checklist of information that includes guidelines for reporting proof of concept or pilot study trials. See the CONSORT extensions for additional information (**http://www.consort-statement.org/extensions**).

Such trials require adequate sample size (demonstrated through the presentation of a power analysis) and state clear aims and hypotheses. Any anonymising (e.g., of researchers) and problems of de-anonymising should be clearly detailed. An appropriate follow-up period is required. Clear definitions of terms such as ‘attrition’, ‘remission’ and ‘recovery’ are required, and intervention protocols should be readily available to the reader. The study description should conform to the CONSORT 2010 checklist of information that must be included when reporting a randomized trial. Preregistration is required.

Reporting of intent-to-treat results is preferred unless a strong rationale for a different approach is provided, such as a large amount of missing data. Completer results can also be reported if this is considered to add important information. Results should include the mean and standard deviation of pre- and post-scores, within-group effect sizes with 95% confidence intervals, and pre- and post-score correlations (allowing within-subject effect sizes to be verified). Appropriate follow-up data are desirable.

Implementation Studies

Implementation focuses on the evaluation of an evidence-based intervention that can be widely adopted and maintained in real world settings. Implementation studies address outcomes described in the RE-AIM framework, notably reach or uptake of services, effectiveness, adoption, implementation and maintenance.

Implementation pays attention to the components of the implementation strategy, and contextual factors that support or hinder the achievement of impacts. Attention is paid to intervention transferability into different contexts, an important aspect of long-term implementation. Such reports typically include economic evaluations.

The Standards for Reporting Implementation Studies (StaRI) Statement should be used to guide the writing of such papers.

Qualitative Studies

Studies must delineate the approach (e.g., grounded theory, etc.) for the qualitative methodology used, and authors should identify the research paradigm (e.g., postpositivist, constructivist/interpretivist, etc.). Methodology, results, and the resulting discussion must be consistent with the chosen approach and paradigm. Studies using qualitative data must also include a statement about how sample size was determined (e.g., in relation to sampling saturation, etc.). Authors should refer to Table 1 in O'Brien et al. (2014) doi: 10.1097/ACM.0000000000000388.

Appendix F: The Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 2008)

Eating Disorder Examination Questionnaire (EDE-Q)

The following questions are concerned with the past four week **(28 days)** only. Please read each question carefully. Please answer all the questions.

Thank you. For questions 1 to 12 please select the appropriate answer on the right. Remember that the questions only refer to the past four weeks (28 days) only.

On how many of the past 28 days...	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1. Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	☐	☐	☐	☐	☐	☐	☐
2. Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape and weight?	☐	☐	☐	☐	☐	☐	☐
3. Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	☐	☐	☐	☐	☐	☐	☐
4. Have you tried to follow definite rules regarding your eating (for example,, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	☐	☐	☐	☐	☐	☐	☐
5. Have you had a definite desire to have an empty stomach with the aim of influencing your shape or weight?	☐	☐	☐	☐	☐	☐	☐
6. Have you had a definite desire to have a totally flat stomach?	☐	☐	☐	☐	☐	☐	☐

7. Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (for example, working, following a conversation or reading)?	☐	☐	☐	☐	☐	☐	☐
8. Has thinking about shape or weight made it very difficult to concentrate on things that you are interested in (for example, working, following a conversation or reading)?	☐	☐	☐	☐	☐	☐	☐
9. Have you had a definite fear of losing control over eating?	☐	☐	☐	☐	☐	☐	☐
10. Have you had a definite fear that you might gain weight?	☐	☐	☐	☐	☐	☐	☐
11. Have you felt fat?	☐	☐	☐	☐	☐	☐	☐
12. Have you had a strong desire to lose weight?	☐	☐	☐	☐	☐	☐	☐

For questions 13-18 please fill in the appropriate number in the box below each question. Remember that the questions only refer to the past four weeks (28 days).

13. Over the past 28 days, how many times have you eaten what other people would regard as an unusually large amount of food (given the circumstances)?	Click or tap here to enter text.
14. …On how many times of these times did you have a sense of having lost control over your eating (at the time that you were eating)?	Click or tap here to enter text.
15. Over the past 28 days, on how many DAYS have such episodes of overeating occurred (i.e. you have eaten an unusually large amount of food and have had a sense of loss of control at the time)?	Click or tap here to enter text.
16. Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight?	Click or tap here to enter text.

17. Over the past 28 days, how many times have you taken laxatives as a means of controlling your shape or weight?	Click or tap here to enter text.
18. Over the past 28 days, how many times have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat, or to burn off calories?	Click or tap here to enter text.

For the next set of questions please select the appropriate answer. Please note that for these questions the term "binge eating" means eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

Over the past 28 days…	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
19. Over the past 28 days, on how many days have you eaten in secret (ie, furtively)? … Do not count episodes of binge eating.	☐	☐	☐	☐	☐	☐	☐
	None of the times	A few of the times	Less than half	Half of the times	More than half	Most of the time	Every time
20. On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? … Do not count episodes of binge eating.	☐	☐	☐	☐	☐	☐	☐

Over the past 28 days…	Not at all (0)	(1)	Slightly (2)	(3)	Moderately (4)	(5)	Markedly (6)
21. Over the past 28 days, how concerned have you been about other people seeing you eat? …	☐	☐	☐	☐	☐	☐	☐

Do not count episodes of binge eating							
22. Has your weight influenced how you think about (judge) yourself as a person?	☐	☐	☐	☐	☐	☐	☐
23. Has your shape influenced how you think about (judge) yourself as a person?	☐	☐	☐	☐	☐	☐	☐
24. How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	☐	☐	☐	☐	☐	☐	☐
25. How dissatisfied have you been with your weight?	☐	☐	☐	☐	☐	☐	☐
26. How dissatisfied have you been with your shape?	☐	☐	☐	☐	☐	☐	☐
27. How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	☐	☐	☐	☐	☐	☐	☐
28. How uncomfortable have you felt about others seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	☐	☐	☐	☐	☐	☐	☐

What is your weight at present (in kg)? Please give your best estimate	Click to enter text.
What is your height (in cm)? Please give your best estimate	Click to enter text.

If female:

Over the past three-to-four months have you missed any menstrual periods?	Choose an item.
If so, how many?	Click or tap here to enter text.
Have you been taking the “pill”?	Choose an item.

Appendix G: The Clinical Impairment Assessment (CIA; Bohn & Fairburn, 2008)

Clinical Impairment Assessment (CIA) Questionnaire

Please select the option which best describes how your eating habits, exercising, or feelings about your eating, shape, or weight have affected your life over the past four weeks **(28 days).** Thank you.

Over the past 28 days, to what extent have your eating habits, exercising or feeling about your shape and weight…	Not at all	A little	Quite a bit	A lot
1. Made it difficult to concentrate?	☐	☐	☐	☐
2. Made you feel critical of yourself?	☐	☐	☐	☐
3. Stopped you going out with others?	☐	☐	☐	☐
4. Affected your work performance (if applicable)?	☐	☐	☐	☐
5. Made you forgetful?	☐	☐	☐	☐
6. Affected your ability to make everyday decisions?	☐	☐	☐	☐
7. Interfered with meals with family or friends?	☐	☐	☐	☐
8. Made you upset?	☐	☐	☐	☐
9. Made you feel ashamed of yourself?	☐	☐	☐	☐
10. Made it difficult to eat out with others?	☐	☐	☐	☐
11. Made you feel guilty?	☐	☐	☐	☐
12. Interfered with you doing things you used to enjoy?	☐	☐	☐	☐
13. Made you absent-minded?	☐	☐	☐	☐
14. Made you feel a failure?	☐	☐	☐	☐
15. Interfered with your relationships with others?	☐	☐	☐	☐
16. Made you worry?	☐	☐	☐	☐

Appendix H: Anonymised summary of initial feedback from staff and patients at Cotswold House used to derive adapted versions of the EDE-Q and CIA

Staff Comments
I fully support adaptations, as it must be very strange as an inpatient to be asked some of those questions! Only thing is how any adaptations would work for our reporting purposes – EDE-Q is used as part of the national reporting to NHSE, so we may need to consider that moving forward.
There are questions beginning with "have I tried" and I assume people will say – no because I am in a hospital". The question about trying to lose weight is the same – again they cannot because they are in hospital
Questions 16,17,18,19 ,20 and 21 do not apply if in treatment already 9,10,11,12,13 would these questions be relevant if already an inpatient? I am not sure they would apply as already on a specific meal plan regime. 24 weighing twice weekly already so doesn't apply to in patients. 25,26.27,28 not while in treatment Questions 5 &6 very similar and not sure if needed.
There are a variety of ways that you might deal with the problem of asking about behaviours that are restricted for inpatients-one obvious way is to just use the global scale which refers to attitudes, thinking etc rather than frequencies of behaviours such as vomiting, laxative use, binge eating and exercise. It has been used as an outcome measure in a number of studies. Another way would be to use one of the shorter forms of the measure (which may be more factor analytically sound and does not include frequencies of certain behaviours)-also quicker to use etc.
EDE-Q The time frame needs reducing. Inpatient treatment is very intense with multidisciplinary approaches to tackling an eating disorder. The questions should refer to the last two weeks, in line with the EDE-A or even the last week There are 12 questions which I believe are not appropriate for inpatients and therefore need removing OR adapting. These are: 1, 2, 3 and 4 10 (could be changed to distress about weight restoration) 13, 14, 15, 16, 17 – patients do sometimes purge (vomit) but toilets are locked for an hour after eating and this is monitored. A question about vomiting should be adapted 19, 24

CIA As with the EDE-Q, I recommend reducing the timeframe. Five items could be removed as a result of not being 3, 4, 7, 10, 12,
EDE-Q 28 days is too long for inpatient - may not give an accurate reflection of severity of ED in an acute inpatient setting Q1 - Nature of having meal plans in inpatients means they can't 'deliberately' limit food as they would usually Q2 - Restricted setting in inpatients means these are controlled as much as possible 7Q3 AND Q4 - Unsure if this relevant also? – we accommodate for three dislikes which may be 'excluding' something from their diet, but ultimately, 'excluding from your diet' is eliminated in our treatment Q10 - Is this appropriate? – inpatient's aim is weight restoration therefore 'might gain' is not applicable Q13 - Is this applicable as we have set meal plans? Q15: unlikely to occur due to set meal plans Q19 - not applicable especially for newer admitted patients, though it can happen to other patients who may do this to falsify weight **CIA** Items 10, 7, 4, 3 were not appropriate for inpatients
The measures need to be short and brief. They should be easy to collect. It is important to think about what the measure will be used for (*Rob referenced the paper titles Clinical Outcomes in Adult Mental Health Services which Layla has a copy of*). Could there also be a personalised measure of recovery? You would need a different measure for day patients. Collecting staff views are important as this will be informed by clinical experience - marker. Make changes and then present it back to them. Could use the Delphi method – then do the test of change.
There are a few questions that might not apply to our patients (the ones about binging for those who do not have any leave, or the ones about eating in secret).
These two adapted questionnaires seem to have the right length if I put myself in the position of someone who has to complete this by being malnourished. All questions are well formulated but I have comments for question number 5 and 10 of the EDE-Q. Nothing to comment about the CIA at all.

5. Have you had a definite desire to have an empty stomach with the aim of influencing your shape or weight? □ Any chance to also add the word 'numb' stomach in brackets? These may be two different terms but some patients tell me 'It is not about having an empty stomach but about feeling that my stomach is numb'. To me it has similar meaning and it may affect how they answer that question if they don't see the alternative such as 'numb' stomach. Just a thought! 10. Have you had a definite fear that you might gain weight? □ Could be add the word 'restore' weight in brackets here? I know Dr. Ayton is not a fan of the word 'gain' because they actually cannot gain any weight if they are underweight. They are only restoring. Not sure if I make sense or whether you have another idea!
I guess for your purpose the first question is whether amending or editing down these measures is the best approach or whether there are other briefer measures better suited to inpatient settings…….In terms of which specific questions to remove I don't think I am the right person as not my clinical area – but what I would say is that reliable use of a less comprehensive measure is much better than patchy use of a more comprehensive one – and that I would support your sense that when people are in crisis they are simply not going to engage meaningfully with a lengthy measure which impacts on the reliability of the whole exercise.
I think questions 2 and 3 could be modified. Could it specify 'negatively' influenced how you think about yourself? Just wondering if people who have completed treatment may be positively influenced by being a healthy weight. Also the work question….could that be academic or work requiring concentration?
Patient comments
EDE-Q The 28 day time period "doesn't apply if you are in or have just come out of hospital" Question 13, 14 and 15 "can't happen if you are an inpatient" Q19 "doesn't apply if you are in or have just come out of hospital"
EDE-Q "I think this should be a pre admission or arrival questionnaire, not for inpatients" Questions 5, 6, 7, 8, 11, 12, 18, 20, 21, 22, 23, 24, 25, 26, 27 & 28 ARE suitable for inpatients
EDE-Q What is the point in asking a question about going long periods of time without eating on a ward. Those are great when you first come in – once you are on a ward, there is no point

Questions about frequency are less helpful – I mean how often I actually do something. It is more helpful to be asking "Is this constantly on my mind?" Questionnaires should only ask about the last week – 28 days is too long Asking about calorie limits is pointless (Meg disagreed)
Questionnaires should only ask about the last week – 28 days is too long. I cannot remember that far back. **EDE-Q** I never think about whether I have done something once a day or three times a day – that is hard to remember You can still ask about calorie limits because there is a choice on the ward, so you could ask about whether people had always chosen the lower one Q4 - Why don't you change it to "have you tried to follow definite rules regarding your eating" and leave it at that because it might not be about shape or weight Question 2, 13, 14, 15, 17, 19, 20 and 24 don't work unless you are on leave **EDE-Q** Question 3, 4, 7, and 10 don't work for inpatients
Questionnaires should only ask about the last week – 28 days is too long. There should be a sub section for people on leave **EDE-Q** It would be more helpful to ask how much things have bothered me, rather than how many days. The questions that do not work for inpatients include 2, 10, 13, 14, 15, 16, 17, 18, 19, 20 It might be helpful to have a separate question on calories and then one on **CIA** Question 4 does not work
Questionnaires should only ask about the last week – 28 days is too long. **EDE-Q** Question 2 is extremely triggering – we cannot do that (go for long periods without eating) regardless of how much you want to

Questions 13, 14 and 15 are not useful for inpatients because “inpatients have to eat a lot regardless”

Question 19 is not useful for inpatients because “we can’t eat in secret unless we leave”. Question 24 doesn’t work unless we leave

CIA

Several of the questions on the CIA are triggering. 7, 10 and 15 – “being an inpatient is hard enough without being reminded of the impact on our lives”

EDE-Q

Questionnaires should only ask about the last week – 28 days is too long. You could ask about other eating disorder behaviours like eating one thing before another.

Questions which could be removed include

2, **9, 12, 13, 14, 15, 16, 17, 18, 19, 24**

CIA

The EDE-Q has limited use in an inpatient setting, particularly in terms of the questions regarding restraint and overeating, and compensatory behaviours like vomiting, laxative use, and exercise, as these aren’t possible in an inpatient setting. Additionally, there are limitations on the use of the questions about wanting to lose weight or fear of gaining weight as weight restoration is often a necessary part of treatment and in an inpatient setting there can be some ambivalence and mixed feelings about this.

The EDE-Q is not administered very often. Weight and bloods are taken very regularly – more than weekly and sometimes daily. It gives the impression that physical health is more important than how we are feeling emotionally or psychologically

Also, so many items on the EDE-Q are not suitable for those in an inpatient setting. – Or, in fact, for patients coming from any other healthcare setting (i.e. I had been hospitalised and under medical care for more than 28 days prior to my admission and therefore a lot of questions were nullified from the very outset).

It is all quite leading – like you have to fit this model of the perfect eating disorder You might be tempted to say that you do have something that you don’t….

What if you get rejected for treatment because the questionnaire says that you don’t have an ED? How about ask people to write a sentence about how they are doing at the moment and look for key words.

EDE-Q

I can never remember as far back as 28 days – I just have to guess.

Questions which Grace indicated she did not think were appropriate for inpatients included: 2, 4, 13, 15, 19 "This questionnaire works better as an initial assessment. It focusses too much on the negative" For question 10, it is "not helpful because you WILL gain weight, maybe rank the fear instead?" For question 16, "maybe change the question – the toilets are locked, so maybe rate the desire to purge"? Same for question 18 – "You could exercise in theory but kind of don't… there is not the opportunity. You would be stopped and face consequences if it was discovered" **CIA** Question 3 "being an inpatient stops you, there fore it is not the habits /thoughts etc themselves – this kinda just makes me angry as a question" Questions that are not appropriate are 4, 7, 10, 12, 14,
It is extremely stressful to be asked how often you have done things that you really want to do – like restrict – but can't. It makes me think I should be doing it
Question 2 is NA if an inpatient Questions 14, 15, 17 & 19 are N/A if an inpatient

The below table provides a summary of the above patient and staff feedback on EDE-Q and CIA items based on frequency mentioned by respondents. Highlighted in blue are the items which were altered as part of the adaptation process. Please note that frequency of mentions by respondents did not necessarily indicate changes made to the measures, as these were contextualised to the reasons for mentioning each item as displayed in the above table.

EDE-Q				**CIA**			
EDE-Q	**Mentioned by patients**	**Mentioned by Staff**	**Total**	**Question**	**Mentioned by Patients**	**Mentioned by Staff**	**Total**
Q1	0	3	3	Q2	1	0	1
Q2	6	3	9	Q3	2	2	4
Q3	2	2	4	Q4	3	2	5
Q4	3	3	6	Q7	3	2	5
Q5	1	1	2	Q10	3	2	5
Q6	1	1	2	Q12	3	1	4
Q7	2	0	2	Q14	2	0	2
Q8	1	0	1	Q15	1	2	3
Q9	1	1	2	Q17	1	0	1
Q10	4	3	7	Q19	1	0	1
Q11	1	1	2				

Q12	2	1	3				
Q13	5	3	8				
Q14	5	1	6				
Q15	5	2	7				
Q16	2	2	4				
Q17	3	2	5				
Q18	2	1	3				
Q19	4	2	6				
Q20	2	1	3				
Q21	1	1	2				
Q22	1	0	1				
Q23	1	0	1				
Q24	4	2	6				
Q25	1	1	2				
Q26	1	1	2				
Q27	1	1	2				
Q28	1	1	2				

Combined Summary:

EDE-Q

Both staff and patients identified numerous questions (especially Q2, Q10, Q13, Q14, Q15, Q19, Q24) as not suitable for inpatients due to the controlled environment and focus on behaviours they cannot perform.

Consensus that the 28-day period is too long, with a preference for reducing it to one week.

Both groups noted the irrelevance and potential triggering nature of behavioural questions in an inpatient setting.

Both staff and patients suggested modifications to make questions more relevant to current psychological and emotional states and less focused on behaviours.

CIA

Agreement on several questions being irrelevant or triggering (especially Q4, Q7, Q10).

Both groups emphasized the need for a shorter, more relevant measure for inpatients.

Appendix I: Changes made to EDE-Q and CIA for inpatient adaptation with accompanying rationale

EDE-Q changes:

Change number	Item changed	Description	Rationale
1	Timescale changed from 28 days to 7 days	Change in timescale in which items are considered by, from 28 days in the original, to 7 days. This also results in a change in the likert scale of items from ranging 0-28 days, to 0-7 days.	Patients stated that it is too difficult sometimes to accurately cast back the last month, and also that things change often in hospital so it is worth capturing things on a week-by-week basis. They also felt that more data would allow for more realistic and accurate views on how change had been made
2	**If you would like to expand/clarify any of your answers, please write details here:** box provided on each page	This text, followed by a free-text box, is provided in each of the 4 pages of the printed version of the EDE-I	Questions are often contextual and it may be helpful for staff to understand the context to which certain answers are provided. This also helps with concern that previously patients did not feel heard about their experiences
3	1. Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	Removed	Patients cannot deliberately restrict their food by choice due to inpatient ward rules
4	2. Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape and weight?	Removed	Patients cannot go for long periods without eating due to ward timetabling
5	3. Have you tried to exclude from your diet any foods that	Removed	Patients do not actively select their

	you like in order to influence your shape or weight (whether or not you have succeeded)?		diet as it is based on meal plans
6	4. Have you tried to follow definite rules regarding your eating (for example,, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	Removed	As above, patients follow meal plans and do not have autonomy over their eating choice and times
7	9. Have you had a definite fear of losing control over eating?	Removed	Meal plans are carefully agreed with the team and it is not possible to access food beyond the meal plan due to the hospital kitchen only being accessible to staff; responsibility to control eating is not with the patient
8	10. Have you had a definite fear that you might gain weight?	Reworded: 17. Have you felt fearful about weight restoration (or maintaining a healthy weight)?	Patients stated that the concept of "fear of gaining weight" is less pertinent than their view of the fact they will gain weight, as weight restoration is standard to hospital care
9	13. Over the past 28 days, how many times have you eaten what other people would regard as an unusually large amount of food (given the circumstances)?	Removed	Patients follow meal plans and as they follow a plan which indicates this is the suitable amount of food for them, this did not feel it applied to inpatients
10	14. …On how many times of these times did you have a sense of having lost control over your eating (at the time that you were eating)?	Removed	"These times" refers to question 13, which has been removed, making this inapplicable
11	15. Over the past 28 days, on how many DAYS have such episodes of overeating occurred (i.e. you have eaten an unusually large	Removed	"Such episodes" refers to question 13, which has been

	amount of food and have had a sense of loss of control at the time)?		removed, making this inapplicable
12	16. How many times have you made yourself sick (vomit) as a means of controlling your shape or weight?	Reworded: Have you had a strong urge to make yourself sick (vomit) as a means of controlling your shape or weight?	Patients' means to indue vomiting is restricted due to availability of private spaces etc on the ward. It was felt that capturing the desire to vomit would be more representative of this concept, as in the original wording, one must have the urge to vomit before making themselves vomit
13	17. Over the past 28 days, how many times have you taken laxatives as a means of controlling your shape or weight?	Removed	Removed, as laxatives are contraband to the ward and so it is inappropriate to ask about their use whilst an inpatient
14	18. Over the past 28 days, how many times have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat, or to burn off calories	Reworded: Have you had a strong urge to exercise in a "driven" or "compulsive" way as a means of controlling your weight or shape?	Ability to exercise is restricted on the ward, however, as with the rewording to item 16, patients may have the strong urge to enact this behaviour
15	19. Over the past 28 days, on how many days have you eaten in secret (ie, furtively)? … Do not count episodes of binge eating.	Removed	Due to limitations on private spaces and ward observations, eating in secret is felt inappropriate to ask
16	24. How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	Reworded: How upsetting have you found it being weighed as part of your treatment?	Patients are weighed weekly as part of their routine treatment. The wording has been changed to reflect this

17	27. How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	Reworded: 15. How uncomfortable have you felt seeing your body (for example, while undressing or as a reflection)?	The example of a shop window reflection felt inapplicable to an inpatient setting. The bath or shower examples would be captured under undressing, so this was removed also
18	28. How uncomfortable have you felt about others seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	Reworded: How uncomfortable have you felt about others seeing your shape or figure?	The examples provided did not feel applicable to an inpatient environment

CIA changes:

Change number	Item	Rationale
1	Timescale changed from 28 days to 7 days	Patients stated that it is too difficult sometimes to accurately cast back the last month, and also that things change often in hospital so it is worth capturing things on a week-by-week basis. They also felt that more data would allow for more realistic and accurate views on how change had been made
2	**If you would like to expand/clarify any of your answers, please write details here:** box provided at bottom of page	Questions are often contextual and it may be helpful for staff to understand the context to which certain answers are provided. This also helps with concern that previously patients did not feel heard about their experiences
3	Removed item 3. Stopped you going out with others?	This item is more directly restricted by ward restrictions than due directly to eating disorder pathology
4	Removed item 4. Affected your work performance (if applicable)?	This item is more directly restricted by ward restrictions than due directly to eating disorder pathology

5	Removed item 7. Interfered with meals with family or friends?	This item is more directly restricted by ward restrictions than due directly to eating disorder pathology
6	Removed item 10. Made it difficult to eat out with others?	This item is more directly restricted by ward restrictions than due directly to eating disorder pathology
7	Removed item 12. Interfered with you doing things you used to enjoy?	This item is more directly restricted by ward restrictions than due directly to eating disorder pathology
8	Removed item 15. Interfered with your relationships with others?	This item is more directly restricted by ward restrictions than due directly to eating disorder pathology

Appendix J: Eating Disorder Examination – Questionnaire for Inpatients (EDE-I) used in this study

Eating Disorder Examination Questionnaire – Adapted for Inpatients (EDE-I)

The following questions are concerned with the past week **(7 days)** only.

On how many of the past 7 days...	No days	1-2 days	3-4 days	5-6 days	7 days
1. Have you had a definite desire to have an empty stomach with the aim of influencing your shape or weight?	☐	☐	☐	☐	☐
2. Have you had a definite desire to have a totally flat stomach?	☐	☐	☐	☐	☐
3. Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in?	☐	☐	☐	☐	☐
4. Has thinking about shape or weight made it very difficult to concentrate on things that you are interested in?	☐	☐	☐	☐	☐
5. Have you felt fat?	☐	☐	☐	☐	☐
6. Have you had a strong desire to lose weight?	☐	☐	☐	☐	☐
7. Have you had a strong urge to make yourself sick (vomit) as a means of controlling your shape or weight?	☐	☐	☐	☐	☐
8. Have you had a strong urge to exercise in a "driven" or "compulsive" way as a means of controlling your weight or shape?	☐	☐	☐	☐	☐
9. On what proportion of the times that you have eaten have you felt guilty because of its effect on your shape or weight? … Do not count episodes of binge eating.	☐	☐	☐	☐	☐
If you would like to expand/clarify any of your answers, please write details here:					

Over the past 7 days:	Not at all (0)	(1)	Slightly (2)	(3)	Moderately (4)	(5)	Markedly (6)
10. How concerned have you been about other people seeing you eat?	☐	☐	☐	☐	☐	☐	☐
11. Has your weight influenced how you think about (judge) yourself as a person?	☐	☐	☐	☐	☐	☐	☐
12. Has your shape influenced how you think about (judge) yourself as a person?	☐	☐	☐	☐	☐	☐	☐
13. How dissatisfied have you been with your weight?	☐	☐	☐	☐	☐	☐	☐
14. How dissatisfied have you been with your shape?	☐	☐	☐	☐	☐	☐	☐
15. How uncomfortable have you felt seeing your body (for example, while undressing or as a reflection)?	☐	☐	☐	☐	☐	☐	☐
16. How upsetting have you found it being weighed as part of your treatment?	☐	☐	☐	☐	☐	☐	☐
17. Have you felt fearful about weight restoration (or maintaining a healthy weight)?	☐	☐	☐	☐	☐	☐	☐
18. How uncomfortable have you felt about others seeing your shape or figure?	☐	☐	☐	☐	☐	☐	☐

If you would like to expand/clarify any of your answers, please write details here:

Appendix K: Clinical Impairment Assessment for Inpatients (CIA-I) used in this study

Clinical Impairment Assessment - Inpatient (CIA-I) Questionnaire.

Please select the option which best describes how your eating habits, exercising, or feelings about your eating, shape, or weight have affected your life over the past week **(7 days).** Thank you.

Over the past 7 days, to what extent have your eating habits, exercising or feeling about your shape and weight…	Not at all	A little	Quite a bit	A lot
1. Made it difficult to concentrate?	☐	☐	☐	☐
2. Made you feel critical of yourself?	☐	☐	☐	☐
3. Made you forgetful?	☐	☐	☐	☐
4. Affected your ability to make everyday decisions?	☐	☐	☐	☐
5. Made you upset?	☐	☐	☐	☐
6. Made you feel ashamed of yourself?	☐	☐	☐	☐
7. Made you feel guilty?	☐	☐	☐	☐
8. Made you absent-minded?	☐	☐	☐	☐
9. Made you feel a failure?	☐	☐	☐	☐
10. Made you worry?	☐	☐	☐	☐
If you would like to expand/clarify any of your answers, please write details here:				

Thank you for completing the measures!

Appendix L: Interview schedule

Post-pilot interview schedule for patients

This interview schedule is designed to last 30-60 minutes. Ensure that interviewees have a copy of the relevant measures (EDE-Q-I and CIA-I) to refer to. These copies should somehow indicate which items were adapted from the original (for example, with an asterisk or bold text), so this can be asked about later in the interview.

Interview question	**Research question being addressed**
Can you describe the ways in which your eating disorder and mental health was monitored over the last six weeks? ***Prompts/follow-up:*** *What tools are used? Were any measures used and explained to you? How frequent were they? Who did them? When did it happen? Would you get feedback and if so, how? Do you know how the information gathered was used?*	None – introduction and orienting Gain information on frequency of measure completion; when they completed measures; what helped them to complete measures; what might help completing them more Why did they choose the frequency they did
How was this different to the ways your eating disorder and mental health was monitored before the last six weeks?	Gain sense of how they feel measures are different – this will not apply to new admissions
Do you feel that the measures used to monitor your mental health over the last six weeks captured the difficulties you were facing as an inpatient and what was most meaningful for you? ***Prompts/follow-up:*** *Relevant prompts for specific questionnaires (EDE-Q-A/I; CIA-A/I). For this question and the subsequent one, encourage the participant to refer to the measures in front of them.*	Can the EDE-Q and CIA be adapted to increase service-specific utility within Cotswold House? Generic question gaining "yes no" views. Potential for exploration here, leading to further questions
For both yes and no responses to the previous questions, ask "in what way?"	Can the EDE-Q and CIA be adapted to increase service-specific utility within Cotswold House?

Prompts/follow-up: What was helpful? What was less helpful? Ask for specifics about questions. ***Prompts/follow-up re measures:*** *Frequency, any specific items or groups being particularly useful OR inappropriate for inpatient items fitting or not fitting their experience. If and how being asked questions that were not relevant to you and make you feel. How did you go about answering the questions that you felt did not apply to your experience?* ***Note:*** *It is possible that this question does not need to be explicitly asked if the participant discusses this during the previous question.*	Gain sufficient detail but minimal prompts for ease of translating to codes etc.
Do you feel that the measures used here are more appropriate at capturing your experience as an inpatient than measures used previously? ***Note****: If not already covered in previous answers*	To assess meeting of success criteria of the PDSA framework Can the EDE-Q and CIA be adapted to increase service-specific utility within Cotswold House?
State: The two measures were adapted from their original versions to make them more specific to inpatient experiences, (state rationale that service users had asked for this change to be made). In the copies in front of you, I have marked which questions we adapted from the original with [whatever method used, eg an asterisk].	**Not needed if sufficient information gained to address research questions** **If not included in answers already, directly ask about the free-text space provided to elaborate on answers: how was this used, should it be changed/kept in/ removed?**
Are there any changes that could be made to the measures used that you think could make them more suitable to inpatient experience?	Can the EDE-Q and CIA be adapted to increase service-specific utility within Cotswold House?

Prompts/follow-up: *Guide the participant through the questions in the measure that were changed.* *Indicated by answers to the previous question(s). How do you think the measures should be delivered? E.g. frequency, would you prefer staff input to complete measures or complete by yourself*	Reword as needed, or incorporate answers from previous questions. Use judgment as will be coded the same; do not ask them to repeat what already said.
Are there things relevant to your stay at Cotswold House, such as your eating disorder, daily needs or other important areas, which you feel I have not asked about that should be asked about? ***Prompts/follow-up:*** *Areas of psychological function that are important and meaningful to them; consider mood, living needs, activity, health and wellbeing, questions, social aspects of inpatient environment. Encourage answers that refer to both to psychometric measures and informal/formal wellbeing checks etc.*	What recommendations can be provided to Cotswold House?
Is there anything that I have not asked today that you would like to discuss?	What recommendations can be provided to Cotswold House?

Appendix M: Feedback from Cotswold House on the recommendations, implementation plan, adapted measures and verbal presentation provided

Service representative 1: Specialist Dietician at Cotswold House

Dear Sean,

You presented today (15 May 2024) on the adaptation of a EIDE-Q and CIA for an inpatient setting at Cotswold House Oxford.

You presented for approximately 45 minutes to a group of 11 clinicians including AHPs, nurses, health care assistants, and medics.

Please see below my feedback

Relevance of SIP to our service

I felt this was a relevant SIP to our service. You explained well that the EDI Q and the CIA were important psychometrics and that they were recommended by NICE guidelines to be used. You were able to highlight the background to the project, and the problem of psychometrics for patients with eating disorders, not translating so well for eating disorders.

You highlighted some qualitative feedback from patients about the psychometrics; in particular, that patients felt they did not 'fit' with their current environment, and so this could be invalidating. You highlighted that it wasn't helpful for patients to be administered these questioners every two weeks because of data contamination.

Sean you did a good job of explaining the context of the appointment and adapting this to a lay person. You were able to clearly define what a psychometric is and why this is relevant to the treatment of eating disorders.

Data collection:

Sean you spoke today about how qualitative information was collected. We were impressed to hear that you received feedback from 24 people which is a good sample size. I was particularly impressed that you had considered getting feedback outside of 9-5 hours, in recognition that some people do not work during the day.

Adapting the measures:

You highlighted from the data analysis, the feedback was very clear in terms of what was inappropriate and needed to be changed. You did highlight that it was important that changes were made keeping in mind the importance of adherence to the core questions as this is a validated tool.

You highlighted that a change in time scale was important.

You recognise that there were negatives and positives to making change to the psychometrics.

You collected the same data following the changes made (test of change).

You had considered the rates of completion. That this had increased, was a positive outcome.

You acknowledged that there may need to be further adaptions to measure for things like home leave.

Presentation skills:

Sean you are a competent communicator. You spoke at an appropriate pace and tone. You modified your language to adapt to the audience. You coped well with the last-minute change (our smart screen not working and having to prints slides).

Your use of patient quotes was particularly impacting.

You were able to show empathy for our service users and clearly knew that the specific needs of our patient group (this shows that you had done your own learning around the psychopathology of eating disorders).

I was impressed by your ability to effectively relay the qualitative data (how patients felt having to fill out forms which were not specific to their current treatments) in a compassionate way, supported by your data collection.

Thank you Sean, for presenting to us today. Thank you also for your work within this QI project. I look forward to this being more widely tested and then more widely used in SEDUs to measure change over time.

Service representative 2: Occupational Therapist at Cotswold House

Relevance and importance of this service improvement project (SIP) for the service.

Firstly, it follows the NICE guidelines and it is now more relevant to the inpatient environment.

Feedback from patient very important

EDE-Q shorter now, easier for patients to complete and participate often

The impact of the SIP on the service.

We have more data as rates of completion have improved

More data = more chances to improve patients' outcomes

Increase rate of completion

It means something to the individual

Change in the timescale, it has become more holistic with more positive emotions (so important for our patients to feel positive about their recovery / quality of life)

The role and conduct of the trainee in completing the project within the service.

Lots of work and input shown behind the scenes of the SIP

Really listened to the patients' concerns of these measures, they were engaging and not been reminded of past unhelpful behaviours / memories

The findings produced from the SIP, and the recommendations provided by the trainee.

Effective use of changing some of the language in questionnaires to make it fit the inpatient environment = data accuracy

Adding text boxes to gain qualitative data very helpful

When patients go on leave… can the questionnaires be slightly adapted?

The trainee's presentation of SIP feedback to the service.

Slides very engaging and verbal presentation very informative and engaging

Self-confidence by speaker

Shows interest and motivation with the work that has been done and future work around SIP

Cannot wait to hear about the themes!

Crucial to see patient involvement in this project so the patients have felt empowered

Appendix N: Anonymised representation of tabulated verbatim quotes, in accordance with the framework method of qualitative analysis (Gale et al., 2013)

The initial theme and their subthemes are defined and presented in tabulated form. Below, a second table contained verbatim quotes from each participant (inserted into all blank cells) is constructed. This is repeated for all initial themes. Verbatim quotes removed, presented for illustrative purposes.

Code	Description
Purpose	
Questions relevant to inpatient experience	The changes to the questionnaire items in relation to the purpose of being adapted for inpatient settings
How they are distributed by the service	The way the service applies the measures being suited to their purpose
For the benefit of the service or patients	Whether the purpose of the measure was felt to reside in their benefit to the patients, or to the service
Timescale is more appropriate	How changing the timescale of measurement from 28 days to 7 days suited the purpose of the measures

Purpose				
Participant	**Questions relevant to inpatient experience**	**How they are distributed by the service**	**For the benefit of the service or patients**	**Timescale is more appropriate**
P1				
P2				
P3				
P4				
P5				
P6				
P7				
P8				
P9				

Code	Description
Energy and motivation	
Timescale of measures	Any way in which the measurement of items over the last 7 days, or the weekly completion of measures, impacted energy and motivation

Cognitive demands of measures	Ways in which the measures related to cognitive burden affecting energy and motivation. In particular this includes ideas about revised wording and reduced number of items
Meaningfulness of the measurement process	Ways in which the measures felt applicable to a sense of meaning for the patients, driving motivation. Better wording of questions, and feelings that the measures were for patients rather than the service, underscore this idea.

Energy and motivation			
Participant	**Timescale of measures**	**Cognitive demands**	**Meaningfulness of the process**
P1			
P2			
P3			
P4			
P5			
P6			
P7			
P8			
P9			

Code	Description
Power and autonomy	
Agency and choice	How independence and choice in completing measures interacted with perceived power
Collaboration with the service	The way the measures fostered partnership between the goals of the patients and service
Pressures related to completing measures	How burdens related to the measures implicated feelings of power and autonomy
Empowerment	How the measures or their delivery increased the perceived power resources of the patients

Power and autonomy				
Participant	**Agency and choice**	**Collaboration with the service**	**Pressures**	**Empowerment**
P1				
P2				
P3				
P4				
P5				
P6				
P7				
P8				
P9				

Code	Description
Emotions	
Dejection and hopelessness	Ways the emotions of dejection and loss of hope interacted with the measurement process
Pressure and power dynamics	How aspects related to power interacted with the emotional experience of patients
Positivity	Empowerment, hope and positivity and which aspects of the measurement process this was located in
Frustration	Not everything related to negative emotion was captured by dejection and hopelessness, patients often referred to feelings of frustration regarding the measurement process

Emotions				
Participant	**Dejection and hopelessness**	**Pressure and power**	**Positivity**	**Frustration**
P1				
P2				
P3				
P4				
P5				
P6				
P7				
P8				
P9				

Code	Description
Improvements	
Alignment with patient goals	Ways in which the measures improved aspects of care that are meaningful and important to patients
Practical advantages	Ways the measures are, in their content or delivery, advantageous over the old measures
Integration with overall care	How the measures interact with other aspects of care, such as wellbeing checks, psychological input, staff relationships, etc.
Person-specific contexts	How the measures may not align with contexts of each patient, most pertinently those with increased home access

Improvements				
Participant	**Alignment with patient goals**	**Practical advantages**	**Integration with overall care**	**Person specific contexts**

P1				
P2				
P3				
P4				
P5				
P6				
P7				
P8				
P9				

Theoretically Driven Research Project Appendices

Appendix O: Author guidance for British Journal of Health Psychology, retrieved from https://bpspsychub.onlinelibrary.wiley.com/hub/journal/20448287/homepage/forauthors.html on April 7 2025

1. SUBMISSION

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- experiential and lived experience of health and illness;
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- psychological factors in screening and medical procedures;
- positive psychological approaches to health and illness;
- psychosocial factors in health-related behaviours;
- influence of emotion on health and health-related behaviours;
- psychosocial processes relevant to disease outcomes;
- psychological interventions in health and disease;
- psychological aspects of prevention and public health.

Papers must make a clear potential contribution to health psychology theory, knowledge and/or practice and employ rigorous research design and methodology.

We do not publish studies where the main focus is on mental health or psychopathology. In addition, we typically do not publish cross-sectional studies or those using only student populations unless there is a strong rationale for doing so.

Papers describing intervention development (without also presenting an analysis of the outcomes of the intervention) will usually only be considered if they make a contribution to health psychology theory, knowledge and/or practice beyond the specific intervention context.

The journal encourages submissions of papers reporting experimental, theoretical and applied studies using quantitative, qualitative and mixed-methods approaches. Research carried out at the individual, group and community levels is welcome. It also welcomes systematic reviews and meta-analyses. Submissions concerning clinical applications of Health Psychology principles and interventions with relevance for Health Psychology outcomes and populations are particularly encouraged.

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- papers reporting original empirical investigations, using quantitative, qualitative or mixed methods;
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- review papers, which should provide systematic overviews, evaluations and interpretations of research in a given field of health psychology (narrative reviews will only be considered for editorials or important theoretical discourses);

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All systematic reviews must be pre-registered and an anonymous link to the pre-registration must be provided in the main document, so that it is available to reviewers. Systematic reviews without pre-registration details will be returned to the authors at submission.

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Keywords

Please provide appropriate keywords.

Acknowledgements

Contributions from anyone who does not meet the criteria for authorship should be listed, with permission from the contributor, in an Acknowledgments section. Financial and material support should also be mentioned. Thanks to anonymous reviewers are not appropriate.

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Appendix P. Full sample demographics

Table P1.

Full sample demographics.

Measure	Whole Sample (N=176)	Main sample (N – ungrouped ; n=159)	HA+AD group (n=54)	AD-only group (n=29)	Non-clinical group (n=76)	Ungrouped (n=17)	Between-groups comparative statistics for whole sample (N=176)
Gender: n(%)							
Female	46 (26.1)	42 (26.4)	22 (40.7)	9 (31.0)	11 (14.5)	4 (23.5)	**$\chi^2_{(3, N=176)}$=11.74, p=.008*; Cramer's V=.258**
Male	130 (73.9)	117 (73.6)	32 (59.3)	20 (69.0)	65 (85.5)	13 (76.5)	
Ethnicity: n(%)							
White British	130 (73.9)	118 (75.6)	37 (71.2)	21 (72.4)	60 (80.0)	12 (70.6)	$\chi^2_{(12, N=172)}$=15.60, p=.202; Cramer's V=.174
White Other	20 (11.4)	18 (11.5)	7 (13.5)	4 (13.8)	7 (9.3)	2 (11.8)	
Asian (Mixed or Other)	5 (2.8)	12 (7.7)	7 (13.5)	4 (13.8)	1 (1.3)	1 (5.9)	
Black African	4 (2.3)	3 (1.9)	0 (0.0)	0 (0.0)	3 (4.0)	1 (5.9)	
Other Mixed	4 (2.3)	5 (3.2)	1 (1.9)	0 (0.0)	4 (5.3)	0 (0.0)	
Employment status: n(%)							
Retired	73 (41.5)	63 (39.6)	22 (40.7)	10 (34.5)	31 (40.8)	10 (58.8)	$\chi^2_{(12, N=176)}$=9.09, p=.696; Cramer's V=.131
Full-time employed	51 (29.0)	48 (30.2)	15 (27.8)	12 (41.4)	21 (27.6)	3 (17.6)	
Part-time employed	27 (15.3)	44 (27.7)	17 (31.5)	6 (20.7)	21 (27.6)	3 (17.6)	
Unemployed	4 (2.3)	3 (1.9)	0 (0.0)	1 (3.4)	2 (2.6)	1 (5.9)	
Student	1 (0.6)	1 (0.6)	0 (0.0)	0 (0.0)	1 (1.3)	0 (0.0)	
Marital status: n(%)							
Married	136 (77.3)	123 (77.4)	44 (81.5)	23 (79.3)	56 (73.7)	13 (76.5)	$\chi^2_{(12, N=176)}$=5.05, p=.969; Cramer's V=.098
Partnered	11 (6.3)	10 (6.3)	4 (7.4)	1 (3.4)	5 (6.6)	1 (5.9)	
Separated	5 (2.8)	5 (3.1)	1 (1.9)	2 (6.9)	2 (2.6)	0 (0.0)	

Widowed	9 (5.1)	8 (5.0)	2 (3.7)	1 (3.4)	5 (6.6)	1 (5.9)	
Single	16 (8.5)	13 (8.2)	3 (5.6)	2 (6.9)	8 (10.5)	2 (11.8)	
Smoking status: n(%)							
Smoker	28 (15.9)	26 (16.4)	6 (11.1)	6 (20.7)	14 (18.4)	2 (11.8)	$\chi^2_{(3, N=176)}$=2.00, p=.574; Cramer's V=.107
Non-smoker	148 (84.1)	133 (83.6)	48 (88.9)	23 (79.3)	62 (81.6)	15 (88.2)	
Age: M (SD)	66.1 (10.0)	65.6 (9.8)	64.9 (10.0)	66.2 (7.5)	65.8 (10.6)	70.6 (10.8)	$F_{(3,172)}$=1.43, p=.24, η^2=.02
BMI: M(SD)	28.1 (4.4)	28.2 (4.3)	28.1 (4.0)	29.5 (5.1)	27.7 (4.2)	27.4 (4.7)	$F_{(3,171)}$=1.45, p=.23, η^2=.03
Days from event to contact: M(SD)	48.2 (24.7)	47.7 (24.5)	52.7 (26.4)	42.7 (26.8)	46.1 (21.6)	52.7 (26.9)	$F_{(3,172)}$=1.47, p=.23, η^2=.03
Baseline depression	5.82 (4.6)	6.2 (4.7)	9.7 (4.0)	8.2 (3.8)	3.0 (2.8)	2.2 (2.0)	**$F_{(3, 172)}$=53.13, p<.001*, η^2=.48**
Baseline anxiety	6.94 (5.0)	7.4 (5.0)	10.8 (3.4)	11.7 (3.3)	3.3 (2.9)	3.0 (2.4)	**$F_{(3, 172)}$=94.90, p<.001*, η^2=.62**
Baseline health anxiety	12.21 (7.1)	11.4 (6.9)	19.5 (4.2)	7.0 (4.3)	7.4 (3.1)	19.5 (4.9)	**$F_{(3, 172)}$=141.56, p<.001*, η^2=.71**
Baseline quality of life	19.0 (6.0)	19.0 (6.2)	20.4 (5.7)	21.6 (6.3)	17.1 (6.1)	18.7 (3.9)	**$F_{(3, 172)}$=5.62, p=.001*, η^2=.09**

*Statistically significant at least the a=.05 level, highlighted in bold for legibility.

[1] For comparative analyses, employment, marital, and ethnic status categories were collapsed due to small subgroup sizes. For employment, "full-time" and "student" were combined, "part-time" was not combined, and "retired" and "unemployed" were combined, to provide "full-time, part-time and not working". For marital status, "married" and "partnered" were combined, as were "single," "widowed," and "separated,", to provide "partnered or not partnered". Ethnic status was combined to "White British" and all others to provide "Not White British". These combinations were made to ensure sufficient cell counts for valid statistical comparison.

Appendix Q. Logistic regression predicting adherence to cardiac rehabilitation

In testing secondary hypothesis (a), binary logistic regression was conducted to examine whether health anxiety, mental defeat, and FRP were independently associated with rehabilitation adherence. Table R1 below is included to provide transparency regarding the individual contributions of each predictor variable, despite the overall model not reaching statistical significance. Although the overall model was not statistically significant, the regression table is presented below to show the individual contributions of each predictor. Notably, mental defeat (MDSP) approached significance (p=.100), as did health anxiety (SHAI; p=.155), and may warrant further investigation in future studies with larger samples.

Table Q1

Outcomes of binary logistic regression for each individual predictor.

Predictor	B	S.E.	Wald	df	Sig.	Exp(B)	95% CI for Exp(B)
SHAI	0.047	0.033	2.019	1	0.155	1.049	.982, 1.119
MDSP	-0.026	0.016	2.704	1	0.100	0.974	.944, 1.005
WARPS	0	0.015	0	1	0.999	1	.972, 1.029
Constant	1.304	0.659	3.913	1	0.048	3.685	–
Model Summary: Nagelkerke R^2 = .037							

Appendix R. Repeated-measures analyses of rehabilitation outcomes by psychological group

Given the outcomes of the primary hypothesis showed the HA+AD group presented with significantly higher levels of mental defeat and FRP than other groups, it was important to assess whether these psychological profiles were associated with differential responses to rehabilitation outcomes. To assess whether rehabilitation outcomes differed by psychological group (HA+AD, AD-only, non-clinical), repeated-measures general linear models (GLMs) were conducted for both fitness (MET scores) and quality of life (DQOL). Time (pre- to post-rehabilitation) was entered as a within-subjects factor, and group status as a between-subjects factor.

For both fitness and quality of life, there was a significant main effect of time (both $p<.001$) with large effect sizes (partial $\eta^2=.299$ for quality of life, partial $\eta^2=.354$ for fitness), indicating overall improvement following rehabilitation. For quality of life, a significant main effect of group was observed with a medium effect size ($F_{(2,95)}=5.47$, $p=.006$, $\eta^2=.103$), with post hoc comparisons showing this was due to higher pre- and post-rehabilitation quality of life scores in the AD group relative to the non-clinical group. For fitness, there was not a significant main effect of group ($F_{(2,85)}=1.33$, $p=.271$). The interaction between time and group was not significant for either fitness ($F_{(2,85)}=2.85$, $p=.063$), but was significant for quality of life ($F_{(2,95)}=4.25$, $p=.017$, $\eta^2=.082$), indicating that while overall improvement occurred, improvement for fitness did not significantly differ by group, but improvement in quality of life did improve significantly by group (Tables S1 and S2). For quality of life, Levene's test indicated homogeneity of variances, so Tukey HSD was used for post hoc multiple comparisons. These showed that the significant difference was driven by differences between the AD-only group and the non-clinical group ($p=.013$).

This could suggest that having anxiety/depression without health anxiety is associated with lower improvements in quality of life. In contrast, the HA+AD group did not differ significantly, suggesting a potentially more complex or non-linear pattern of adjustment. This may indicate that affective symptoms in the absence of health-related concerns are more resistant to change, or that individuals with health anxiety may engage with rehabilitation in adaptive ways.

Table R1

Descriptive statistics for DQOL and MET by group.

Group	DQOL Pre (M, SD)	DQOL Post (M, SD)	MET Pre (M, SD)	MET Post (M, SD)
Overall	18.99 (6.0)	17.33 (4.6)	4.85 (0.9)	5.70 (1.3)
HA+AD	20.40 (5.7)	18.97 (3.8)	4.81 (0.9)	5.34 (1.2)
AD-only	21.55 (6.3)	17.72 (4.6)	4.69 (0.7)	5.56 (1.1)
Non-clinical	17.08 (6.1)	16.33 (4.8)	4.90 (1.0)	6.01 (1.5)

Table R2

Repeated measures GLM for within- and between-subjects effects.

Outcome	Main effect of Time (*p*)	Main effect of Group (*p*)	Time-Group interaction (*p*)
DQOL	<.001	0.740	0.017
METs	<.001	0.225	0.063